STATEMENT OF WORK
Title: UHV optics manipulators
Lab: Physical Measurement lab, Sensor Science Division

I. BACKGROUND INFORMATION

NIST is embarking on a project to support the EUV lithography (EUVL) community by developing characterization of EUV scintillator materials. Many techniques for measuring spatial distribution (or image) of EUV rely on scintillators or devices that convert EUV radiation into visible light. Scintillators tend to be robust and afford the user the ability to use less costly and easier to characterize, visible light detection or imaging systems. However, their characterization requires specialized techniques and hardware which NIST must develop in order to provide accurate characterization of the performance of EUV scintillators.

This purchase supports the "Optical Metrology for Extreme Ultraviolet (EUV) Generation" Project under Grand Challenge 2, "Advanced Metrology for Future Microelectronics Manufacturing," for CHIPS R&D Metrology.

II. PURPOSE

This procurement is for vacuum compatible optical mounts, controllers and accessories for an optical microscope assembly for measuring the visible light output of scintillator samples. The purchase of these components enables NIST to construct an ultra-high vacuum microscope to operate in NIST SURF III EUV reflectometer beamline. The microscope will allow for the measurement of EUV scintillator efficiency, output spectrum and point spread function.

III. MINIMUM REQUIREMENTS

The Contractor shall provide a system that meets all technical specifications identified below. All items must be new. Used or remanufactured equipment will not be considered for award. Experimental, prototype, or custom items will not be considered. The use of "gray market" components are not acceptable. All line items shall be shipped in the original manufacturer's packaging and include all original documentation and software, when applicable.

Line Item 0001:
Description: UHV motorized optical mounts (1")
Quantity: 8

A. Technical Specifications

a. Ultra-high vacuum compatible: low-outgassing materials, pressure range 10^{-8} Torr or better.
b. Optical mount for 1" diameter optics
c. Piezo-driver remote actuators for pitch and yaw axes
d. Angular range: ±5°
e. Open loop

f. In vacuum cable length: 150 mm (minimum)

Line Item 0002:
Description: UHV optical mounts (2")
Quantity: 4

A. Technical Specifications

a. Ultra-high vacuum compatible: low-outgassing materials, pressure range 10^{-8} Torr or better.
b. Optical mount for 2" diameter optics
c. Piezo-driver remote actuators for pitch and yaw axes
d. Angular range: ±5°
e. Open loop
f. In vacuum cable length: 150 mm (minimum)

Line Item 0003:
Description: Motion controller/amplifier
Quantity: 24 axes (2 per mount, 12 mounts in line item 1 & 2)

A. Technical Specifications

a. 2 units to control total combined mounts in line item 1 &2
b. 120 VAC operation, power supply included.
c. Ethernet (preferred), USB, or serial communication
d. LabView programming library
e. Include all power, motor and communication cables.
f. Joystick control (if available) for each controller (2)

Line Item 004: Optional Items
Description: 6" CFF electrical feed through flange(s)
Quantity: 2

A. Technical Specifications

a. Feedthrough flange(s) to support 16 axes motor control operation in atmosphere and motor control in vacuum
b. 6" CFF knife edge flange platform
c. Feedthroughs must use standard connectorized connection, (D-sub, NEMA, etc…)

IV. SCHEDULE OF DELIVERABLES

Define all deliverables and indicate (1) the quantity desired; (2) the format in which each deliverable is to be supplied; (3) the delivery date (based on the number of weeks/days); (4) the place of delivery. The context of each deliverable shall be clear. **Keep in mind that every task does not require a deliverable. Deliverables are always tangible items (i.e., report, minutes, etc.)**

Complete the table providing the information for all the tasks identified above.

Deliverable Number	*Description*	*Quantity*	*Due Date*	*Place of Delivery*
1	**Optical mounts**	**8+4**	**No later than 4 weeks after receipt of order.**	**NIST Gaithersburg**
2	**Motion controller/amplifier**	4	**No later than 4 weeks**	**NIST Gaithersburg**
3	**6" CFF electrical feed through flange**	1	**No later than 8 weeks**	**NIST Gaithersburg**

Standards of Acceptance: The NIST POC or COR shall review all the above deliverables and respond with an acceptance or request for revision email to the Contractor Point of Contact (POC) within 2 weeks of receipt of deliverable. This section applies to deliverables which must be reviewed and approved for acceptances (e.g., draft plans, drawings, etc.)

V. DELIVERY TERMS

Delivery shall be F.O.B Destination (or equivalent incoterms, such as DDP) and shall occur in accordance with the delivery due dates provided in the below table.

FOB Destination means: The contractor shall pack and mark the shipment in conformance with carrier requirements, deliver the shipment in good order and condition to the point of delivery specified in the purchase order, be responsible for any loss of and/or damage to the goods occurring before receipt and acceptance of the shipment by the consignee at the delivery point specified in the purchase order; and pay all charges to the specified point of delivery.

The contractor shall deliver all Line Items to:
National Institute of Standards and Technology
Shipping and Receiving
100 Bureau Drive, Building 301
Gaithersburg, MD 20899
C/O/ POC/COR (Steven Grantham, building 245/C100)

VI. INSPECTION & ACCEPTANCE

In addition to the inspection and acceptance terms articulated in the specific FAR clause that allows the Government reserves the right to perform such performance tests and evaluations as defined below to verify specified system performance. Such tests and evaluations, if performed, shall be conducted within the environment that the system is to be operated. The Contractor has the right to be present during the tests and evaluations, if performed, at the Contractor's expense.

Performance Tests:
1. Review of packing list and included items.
2. Unbox items and inspect for damage.
3. Test mounts, controllers and feed through flange (if optioned) for function
4. Test Feedthrough flange (if optioned) vacuum integrity on vacuum test stand.

NIST may choose at its discretion to forego this part of acceptance testing.
A visual inspection of the equipment will be performed by the NIST POC to identify surface defects or any form of indication that any equipment was damaged during transport to NIST. The Government shall have sole discretion to require repair or replacement of damaged and/or nonconforming supplies at no cost to the Government. The Government at any time prior to acceptance shall reject the equipment due to defects and/or nonconformance. The vendor is responsible for latent defects discovered any time after final inspection. However, the extent of its liability shall be prorated over the useful life of the equipment.

Ownership of the equipment shall transfer to NIST upon acceptance by the Government.

The Government will test, inspect, and accept or reject the equipment within (2 weeks) of the receipt of the equipment unless otherwise indicated above. The Government reserves the right to conduct quality assurance testing to confirm that a given instrument(s) meets the manufacturer's and/or the Government's performance specifications. It is anticipated that the equipment will meet all manufacturer's specifications and/or the Government's performance specifications identified in the most recent operations and maintenance manual for each piece of equipment and/or in this document.

VII. WARRANTY
The contractor shall warranty the entire system for a period of a minimum of 1 year after receipt of the equipment and shall be in accordance with terms in FAR 52.212-4. Warranty shall commence upon acceptance of the system by the Government and at a minimum shall include the following:

1. **Materials are free of defects,**

VIII. PAYMENT SCHEDULE
The Contractor will be paid, in accordance with the payments clause in the contract and as otherwise noted in this document, upon receipt of a proper invoice.

1. 100% after installation and acceptance by the POC of fully installed system, AND
2. After the successful completion of the testing requirements set forth in this document under section set forth in this document, AND

3. After successful demonstration by the instrumentation that it performs in accordance with the requirements set forth in this document.

NOTE: Partial shipments and partial invoices will not be accepted, unless otherwise requested and accepted by the Contracting Officer prior to award offer. Proposed payment schedules shall be submitted with vendor's response to the RFQ for consideration.