

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

Wafer bonder and lithography aligner system

Item to be Scouted

_____ days
Opportunities will be posted for 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).

The National Institute of Standards and Technology (NIST) seeks information on commercial vendors that are capable of providing a wafer bonder and lithography aligner system to support nanofabrication in the Center for Nanoscale Science and Technology (CNST) user facility. The system will be sited and used as a shared resource accessible to researchers from industry, academia, NIST, and other government agencies in the CNST NanoFab. Wafer bonder is a unique fabrication tool that bring two wafers adhere to each other without the application of any macroscopic gluing layer or external mechanical force. It produces a mechanically stable interface and hermetically sealed encapsulation between two wafers. Bonding alignment is the precedent step before the actual wafer bonding. It places two substrates in particular positions relative to each other in order to combine the functions of both substrates. The bonding alignment can be performed by the wafer bonder itself or by a compatible lithography aligner.

2022-127

Supplier Scouting Number (NIST MEP use)

333242

Scouting customer/product NAICS Code, if known

TECHNICAL INFORMATION:	1. Supplier Information	<p>a. Type of supplier being sought*</p> <p> <input checked="" type="checkbox"/> Manufacturer <input type="checkbox"/> Contract Manufacturer <input type="checkbox"/> Distributor </p> <p> <input type="checkbox"/> Other _____ </p>
		<p>b. Reason for scouting submission*</p> <p> <input type="checkbox"/> 2nd Supplier <input type="checkbox"/> Price <input type="checkbox"/> Re-shore <input type="checkbox"/> Past supplier no longer available </p> <p> <input type="checkbox"/> New Product Startup </p> <p> <input checked="" type="checkbox"/> Other _____ </p>
	2. Summary of Technical Specifications and Performance Requirements:	<p>a. Describe the manufacturing processes (elaborate to provide as much detail as possible).*</p> <p style="font-size: 24pt; text-align: center;">Item needed as one standalone unit</p> <p>b. Provide dimensions / size / tolerances / performance specifications for the item.*</p> <p style="font-size: small;">A lithography aligner does wafer exposure for pattern transferring purpose as well as alignment for lithography and bonding purposes. Its main components include a UV light source, beam shaping optical lens, wafer positioning system with top and bottom sides of microscopes for the upper and lower wafers. For bonding purpose it shall also have a securing mechanism for the wafer stacks in order to transport aligned wafer pair into wafer bonder without introducing the alignment shift. Applications include fabricating nano-semiconductor and nano-photonics devices. The NanoFab currently operates an outdated wafer bonder and lithography aligner system which is more than 15 years old. After years of extreme thermal cycles and usage, mechanical fatigue has caused certain crucial components losing functions or precision. In the past five years, considerable amount of manpower was put in to maintain this system in usable condition and some replacement parts have been difficult to acquire. In order to increase NIST's capacity to serve users and provide additional technical capabilities for nanofabrication, NIST has a need for a new wafer bonder and lithography aligner system. The system must be equipped with following components: 1. Wafer Bonder configuration: 1) The system shall be able to transfer and process substrates with various shapes and sizes from 10 mm to 150 mm. 2) The system shall be able to process substrates with thickness 9 mm or larger. 3) The process chamber shall be able to perform controlled heating and cooling. 4) The heating system shall support the minimum heating temperature of 500 °C. 5) The system shall be capable of applying voltage on the wafer stacks for anodic bonding. 6) The process</p>

		<p>chamber shall have 2 or more gas ports available. 7) A pumping system for process chamber shall be able to do overpressure and vacuuming down to 1x10⁻⁵ Torr. 8) The system shall have substrate holders supporting bonding alignment of 75 mm, 100 mm and 150 mm diameters of wafers. 9) Software that supports both manual and automatic operations. 10) The system shall be provided with a computer to perform interface, control, and logging functions. 11) Safety interlocks for the chamber door. 2. Lithography aligner configuration: 1) The system shall be able to process substrates with various shapes and sizes from 10 mm to 150 mm. 2) The system shall be able to process substrates with thickness 5 mm or larger. 3) The system shall supply the exposure light source including 405 nm and 365 nm wavelength with sufficient illumination power for 50 μm or thicker broadband photoresist. 4) The system shall be able to expose 1 μm thick photoresist with a resolution of 1 μm or smaller. 5) The system shall be able to align the frontside of a wafer to a photomask with the alignment accuracy 0.5 μm or better and the backside of a wafer to a photomask with alignment accuracy 1 μm. 6) Software shall be able to perform pattern recognition on alignment marks for semiautomatic alignment while still allows manual alignment per the need of operators. 7) The system shall be able to align a wafer to a wafer with the alignment accuracy 2 μm or better for bonding alignment. 8) The system shall provide the mechanism of securing the aligned wafer stack if mechanical transferring into the compatible wafer bonder is required. 9) The system shall have safety interlocks in the illumination housing and proper UV light shielding for operators.</p>
		<p>c. List required materials needed to make the product, including materials of product components.*</p>
		<p>Item needed as one standalone unit.</p>
	<p>2. Summary of Technical Specifications and Performance Requirements cont:</p>	<p>d. Are there applicable certification requirements?* <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please explain</p> <p>e. Are there applicable regulations?* <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please explain</p> <p>f. Are there any other standards, requirements, etc.?* <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Please explain</p> <p>g. Additional Comments: Is there other information that would impact the item's performance or usefulness? Please explain.</p>
<p>BUSINESS INFORMATION:</p>	<p>3. Volume and Pricing</p>	<p>3a. Estimated potential business volume (i.e., # Units Per Day, Month, Year)*: One unit</p> <p>b. Estimated target price / unit cost information (flexible and negotiable <u>not</u> accepted)*: \$1,300,000.00</p>
<p>4. Delivery Requirements:</p>		<p>a. When is it needed by? (Immediate, 30 Days, 6 months, etc.)* ASAP</p> <p>b. Describe packaging requirements (i.e., individually/group packaging)* Flexible</p>

■		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).