

MEPNN Supplier Scouting Opportunity Synopsis

Section 1: General Information

Scouting Number	2026-492
Item to be Scouted	Cryo Mill
Days to be scouted	10
Response Due By	09/20/2026
Description	The EPA requires specialized instrumentation to study both microplastics (small plastic particles measuring less than 5 millimeters (mm) in size) and nanoplastics (small plastic particles that measure less than 1000 nanometers

Section 2: Technical Information

Type of supplier being sought	Contract manufacturer
Reason	heat, especially as the material is ground into smaller material. The ability to maintain a consistent cold temperature during this process is needed to prevent BABA material from melting, which is particularly important for plastic, which can melt from the generated heat to grind small microplastics and nanoplastics under ambient conditions. The Cryo Mill is the only cryogenic grinder that the EPA has determined can meet the government's specifications.
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Manufacture involves a combination of precision CNC machining and TIG welding of cryogenic-grade alloys (like 316L stainless steel) to create vacuum-insulated housings and pressure-tight chambers. Wear-critical components, such as milling jars and media, are produced via powder metallurgy (sintering) and finished with diamond grinding to ensure extreme hardness and tight tolerances. These are integrated with cryogenic-grade PTFE seals, vacuum-brazed heat exchangers, and instrumented with specialized low-temperature thermocouples and brushless drive systems to manage the thermal and mechanical stresses of liquid nitrogen environments.

Provide dimensions / size / tolerances / performance specifications for the item	Cryogenic Grinder capable of milling nanoplastics to less than 1000 nanometers. Benchtop model to fit in current lab space configuration (under 2 ft2 size). These specifications include: 1. Closed-vial system to reduce polymer contamination during use. 2. Stainless steel grinding chamber/ vial and accessories to reduce sample contamination. 3. Liquid nitrogen autofill accessories to provide continuous cooling of system during grinding and liquid nitrogen sensors for safety precautions. 4. Capacity to grind at least 50 mL of material. 5. Ability to use various sizes of grinding slugs or balls to optimize grinding procedures to make reproducible protocols. 6. Benchtop model to fit in current lab space configuration (under 2 ft2 size). 7. Availability of multiple grinding chambers to avoid cross contamination between different polymers, reduce downtime, and increase sample processing. 8. Demonstrated ability to create nanoplastic particles (<1000 nm). 9. Programmable ability to store multiple protocols for accurate replication of procedures. There is no evidence that other products can provide the same reliable results for this niche purpose. The Cole Parmer cryogenic grinder does not claim, either on its website or in any available documentation, to reach such small particle sizes for any material, including plastics. Furthermore, there are no published studies or scientific literature demonstrating its ability to mill nanoplastics to this specification. Other instruments that were marketed to grind material to potentially meet the government's fineness requirement still raised concerns about their applicability to grinding polymers to less than 1000 nm, and also included unnecessary features not needed for polymer milling. For example, the program office examined Verder's MM500 Nano with required accessories. The device states it is capable of achieving a fineness of less than 1000 nm. However, unlike the Cryo Mill, Verder's MM 500 Nano does not have a nitrogen autofill feature to replenish nitrogen during the grinding process and keep samples consistently frozen. This is problematic because according to input from agency scientists, the milling must maintain a constant freezing temperature to prevent the plastic from melting rather than shattering into smaller particles. In addition, the Verder MM500 Control is marketed to achieve a level of fineness of about 1000 nm. However, based on input from the company sales representative, it was not clear that this device could maintain a cold enough temperature to avoid melting plastic polymers – thus it was not recommended for grinding plastics by the manufacturer. Therefore, based on this market research, it was determined that the Cryo Mill's unique configuration and nitrogen autofill process were critical to its reliability for this requirement.
List required materials needed to make the product, including materials of product components	Please see attached SOW
Are there applicable certification requirements?	No
Are there applicable regulations?	No
Are there any other standards, requirements, etc.?	No
Additional Technical Comments	

Section 4: Business Information

Estimated potential business volume	1 unit
Estimated target price / unit cost information (if unavailable explain)	\$60k

When is it needed by?	6 weeks
Describe packaging requirements	Individually wrapped
Where will this item be shipped?	Narragansett, RI 02882

Additional Comments

Is there other information you would like to include?	Agency providing funds: Environmental Protection Agency Name/POC for BABA related questions: Charles Fischer Email address of contact: fischer.charles@epa.gov
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