



**सीएसआईआर - राष्ट्रीय धातुकर्म प्रयोगशाला**  
**CSIR - NATIONAL METALLURGICAL LABORATORY**  
(Council of Scientific & Industrial Research)

Burmamines, Jamshedpur - 831 007  
Tel: 0657 2345 129/132/128/126, Fax: 0657 2345131  
Email: spo@nmlindia.org Website: www.nmlindia.org



22.08.2025

**CORRIGENDUM**

**Tender Reference No. :- P/NC/1325/GSR/SM/OTE/23-24**

**Tender ID :- 2025\_CSIR\_244378\_1**

**Item Name :- Supply, Installation & Commissioning of  
ULTRASONIC SHOT PEENING (USP) MACHINE**

**NOTE: The Bids must be submitted in the Central Public Procurement Portal (URL:<https://etenders.gov.in/eprocure/app>) only. Manual/Offline bids shall not be accepted under any circumstances. Bidders should quote in INR only.**

Consequent to the Pre-Bid Meeting held on 13.08.2025, the revised technical specifications are attached in Annexure-A and Annexure-I.

The bidders are requested to submit their bid based on this revised technical specifications as per Annexure-A.

All other terms and conditions shall remain same.

Stores & Purchase Officer,  
CSIR-NML, Jamshedpur



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### ANNEXURE-A

#### ULTRASONIC SHOT PEENING (USP) MACHINE

**Preamble:** Supply, installation and commissioning of Ultrasonic Shot Peening (USP) machine along with an air compressor for shot peening flat and curved metallic components/samples to induce compressive residual stresses on the surface of the component.

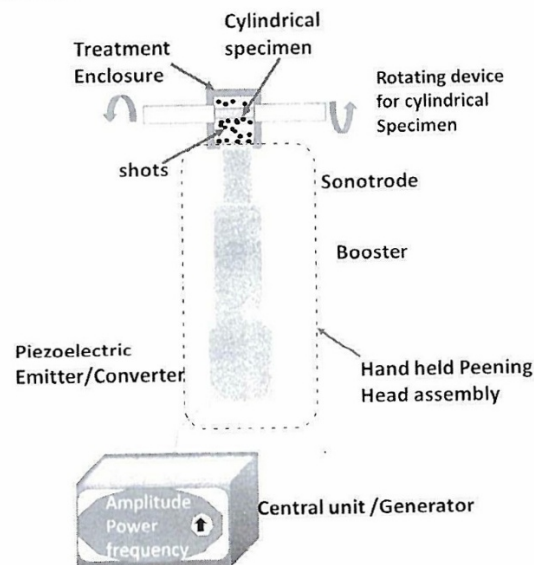
#### SECTION 1: TECHNICAL SPECIFICATIONS

##### 1. USP Method

- USP provide a means of transferring kinetic energy to the peening media (shots) inside a hermetically sealed enclosure using a metallic element vibrating at an ultrasonic wave frequency of 20 kHz or higher.
- The USP equipment must conform to the following standards
  - SAE AMS2580 "Shot Peening, Ultrasonically Activated"
  - SAE AMS2585 "Shot peening Media, Ultrasonically Activated", Rev A.

##### 2. The USP shall be Portable with a hand-held Peening head with the following ultrasonic elements:

- Generator (Digital)
- Emitter (also called converter)
- Booster
- Sonotrode (also called Horn)
- Central Unit (including the Generator, the Human Machine Interface, and components to control the process)
- Treatment Enclosures



Schematic of ultrasonic shot peening machine with cylindrical specimen with rotating arrangement



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- 2.1. Generator – digitally generates a high-voltage electric sine wave at the ultrasonic frequency
  - Digital type.
  - Output Signal: 20 kHz  $\pm$  0.4 kHz or higher
  - Power: 1kW or higher
  - Output Voltage range: 600-1000 V
- 2.2. Emitter (Converter) – Converts the high-voltage electric sine-wave signal to mechanical displacement by the piezoelectric elements
  - Frequency: 20kHz
  - Vibration amplitude output: 20  $\mu$ m peak to peak or higher
- 2.3. Booster: Amplifies the mechanical energy
  - Material: Titanium or similar high corrosion-resistant material
  - Min 20kHz or higher
- 2.4. Sonotrode – transfer the kinetic energy to the peening media (shots)
  - Material: Titanium or equivalent materials;
  - Shape: Rectangular in shape topeen the various samples types given in the Annexure I
  - Resonating Frequency: 20kHz or higher
  - Vibration amplitude: up to 80  $\mu$ m peak/peak or higher, homogeneous at the external surface area
3. **Peening Head**
  - Consists of components S. No. 2.2 to 2.4 in addition to the specific housing and umbilical cable and connectors
  - Shall be Hand-held and portable
4. **Shots (peening media)**
  - Material and hardness: As per SAE AMS 2585.
  - Shots size: 1.0 mm, 2 mm and 3.0 mm diameter
  - Quantity: 100 grams each
5. **Power Parameters of Ultrasonic Shot Peening equipment**
  - Input Voltage: 230  $\pm$  10% V AC; 50/60 Hz; Shall be compatible to Indian power supply
  - Maximum Power: 1000 Watts (without any additional device) or higher
  - Nominal Standard Power: 250 - 400 Watts
  - Cooling media: Compressed air
6. **Central Unit**
  - Central unit is including the Generator
  - Touch screen display Human Machine interface
  - User friendly software programs for working with USP parameters
  - Portable and table top
7. **Treatment Enclosures**
  - Hermitically sealed enclosures for Media to uniformly peen the component surface



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- Material – Polyoxymethylene (POM) or equivalent hard plastic material with low damping coefficient or heat-treated hard steel. Shall be abrasion resistive during peening.
- Treatment enclosure shall accommodate various for sample types given in Annexure 1.
- Automatic rotating device with electrical motor for peening cylindrical samples

**8. Air compressor**

- Portable compressor
- Compressed Air pressure: 6 Bar  $\pm$  15% or higher;
- Flow rate: 250 – 300 Litre/min or higher.
- noise level  $\leq$  60dB
- Dry pneumatic air (ISO 8573-1) Class 4 (Water/particles) & Class 2 (Oil)

**Section II: The following requirements has to be met by the vendors.**

<b>Essential Requirements</b>	<ul style="list-style-type: none"><li>— Manufacturer has to certify/guarantee the availability of accessories/spares for a minimum 5 years after the installation</li><li>— A complete list of spares and consumables required shall be provided separately with cost.</li><li>— At least one previous purchase order copy and contact details of the users of a similar type of system shall be provided along with the offer.</li><li>— Vendor must ensure the availability of service centre in India with qualified engineers</li></ul>
<b>Eligibility criteria</b>	<ul style="list-style-type: none"><li>— Quotations only from the original manufacturer of the equipment or their authorized agents will be accepted.</li><li>— The bidder should have supplied minimum 1 or more similar equipment in last 5 years of time in India or abroad in government or private industries.</li><li>— If the bidder has not supplied similar system anywhere, but claim to have the capability then they should demonstrate one complete testing system with all the test types at their site and at their cost before raising the PO. Willingness in this regard should be indicated in the Technical Bid. The offer is otherwise not acceptable</li><li>— Relaxation in case of MSME and Start-Ups will be given as per the Government rules.</li></ul>





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	<p><i>Note: i. Relaxation of prior turnover and prior experience is applicable to only to all <b>Start-ups</b> recognized by Department for promotion of industry and internal trade(DPIT) subject to meeting of quality and technical specifications. Start-ups may be MSME or otherwise.</i></p> <p><i>ii. Relaxation of prior turnover and prior experience is applicable only to all <b>MSMEs</b> recognized by the Department of Promotion of Industry &amp; internal trade (DPIT) subject to meeting of quality and technical specifications.</i></p>
<b>Scope of Vendor</b>	<ul style="list-style-type: none"><li>Supply, installation, commissioning of USP machine at CSIR-NML, Jamshedpur, India.</li><li>Freight upto CSIR-NML, Jamshedpur.</li><li>Equipment handling, experimental demonstration and necessary training shall be given to personnel for 5 people by the Supplier at CSIR-NML.</li><li>Detailed pre-installation requirements must be furnished along with the offer such as power, space, etc.</li></ul>
<b>Scope of CSIR-NML</b>	<ul style="list-style-type: none"><li>CSIR-NML will provide Electrical Power, space, and sample with various geometries. All other additional and necessary requirements needed to be provided by the supplier.</li></ul>
<b>Calibration</b>	<ul style="list-style-type: none"><li>Fully calibrated system along with all standards for future calibration &amp; standardization of the equipment.</li></ul>
<b>Manuals</b>	<ul style="list-style-type: none"><li>Operational and maintenance manuals in hard as well as soft copies in English.</li></ul>
<b>Warranty</b>	<ul style="list-style-type: none"><li>Standard Warranty of 12 months</li></ul>
<b>AMC after expiry of the warranty</b>	<ul style="list-style-type: none"><li>Non-comprehensive AMC, after the expiry of the standard warranty, should be quoted separately for a minimum of three years.</li></ul>
<b>Delivery Period</b>	<ul style="list-style-type: none"><li>4 months from the date of receipt of PO</li></ul>
<b>Acceptance criteria</b>	<ul style="list-style-type: none"><li>The vendor should successfully demonstrate USP on various sample geometry provided at CSIR-NML.</li></ul>



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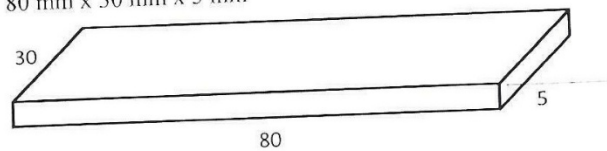
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ANNEXURE-1

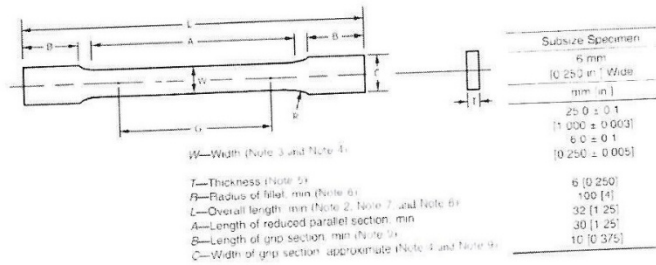
Specimen/Types as per ASTM E8 and ASTM E466

1. Rectangular plate:

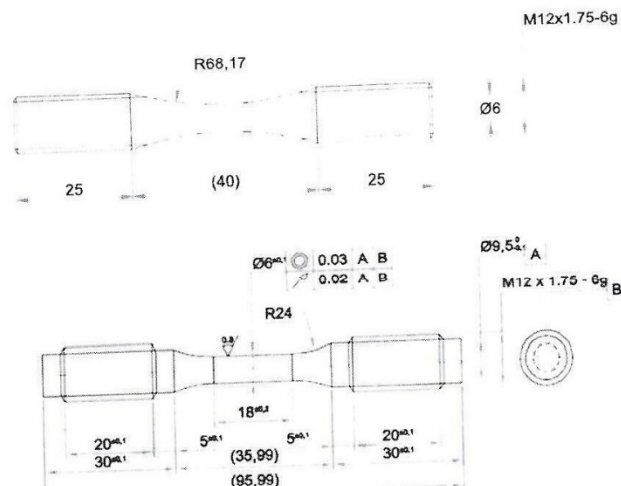
Size: 80 mm x 30 mm x 5 mm



2. Flat Sample



3. Fatigue continuous radius and with gage length specimens: 2 Nos



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