

**QUOTATION DOCUMENTS FOR SUPPLY OF LABORATORY  
EQUIPMENTS/INSTRUMENTS TO MIZORAM STATE POLLUTION  
CONTROL BOARD**



**Mizoram State Pollution Control Board,**  
New Capital Complex, Thlanmual Road, Khatla, Aizawl, Mizoram-796001  
Ph.No.2336173/2336590 Fax:2336591 Email:[mpcb@mizoram.gov.in](mailto:mpcb@mizoram.gov.in)  
Website:<http://www.mpcb.mizoram.gov.in>

## INDEX

---

<i>Contents</i>	<i>page</i>
1. Quotation Notice	1
2. List of equipments/instruments to be quoted	2
3. Technical Specifications of equipments/instruments	3
4. Terms and Conditions	9
5. Format for filling up quotation	11

No.E.55055/Accts./32/2010-MPCB  
**MIZORAM STATE POLLUTION CONTROL BOARD**  
AIZAWL : MIZORAM

Dated Aizawl, the 13<sup>th</sup> August, 2019

**NOTICE INVITING QUOTATIONS**

Sealed quotations are invited from the bona fide manufacturers/authorized distributors/dealers for supply of laboratory equipments/instruments to Mizoram Pollution Control Board. The quotations should be submitted to the undersigned on or before 12:00 Noon of the 6<sup>th</sup> September, 2019 and shall be opened on the same day at 2:00 P.M

The Quotation papers containing details of items to be quoted alongwith specifications, terms and conditions etc. can be obtained from the office of Mizoram State Pollution Control Board on payment of Rs.100/- during office hours and the same is also available at [www.mpcb.gov.in](http://www.mpcb.gov.in)

Sd/-C.LALDUHAWMA  
Member Secretary,  
Mizoram Pollution Control Board  
Mizoram New Capital Complex,  
Thlanmual Road, Khatla, Aizawl, Mizoram-796001  
Ph.: 0389-23316590/2336173 : Email: [mpcb@mizoram.gov.in](mailto:mpcb@mizoram.gov.in)

## 1. List of Equipments/Instruments to be quoted

<i>Sl. No.</i>	<i>Equipment/Instrument</i>	<i>Quantity</i>
1.	Respirable Dust Sampler (PM <sub>10</sub> )	10
2.	Respirable Dust Sampler (PM <sub>2.5</sub> )	2
3.	Automatic Meteorological Monitoring Instrument	4
4.	Electronic Balance	4
5.	Hot Air Oven	4
6.	Spectrophotometer	4
7.	Desiccators	4
8.	Whatman Filter Paper for PM <sub>10</sub> & PM <sub>2.5</sub> air monitors	-

## 2. Specifications

1) RESPIRABLE DUST SAMPLER (PM <sub>10</sub> ) WITH GASEOUS SAMPLING ATTACHMENT	
<i>Flow Rate</i>	0.8 to 1.4 cubic meters per minute free flow with flow stabilization by constant flow control device
<i>Suction Pump/Blower</i>	Brushless and noiseless motor capable of giving flow upto 1.6 m <sup>3</sup> /min
<i>Size Selective Inlet and Particle Size</i>	Cyclonic flow or impaction inlet (as per USEPA design) for cut off particle greater than 10 µm. Particles of 10 microns and below collected on filter media.
<i>Filter holder</i>	Designed to accept any standard glass fiber filter of 20.3 cm x 25.4 cm.
<i>Height of the Inlet</i>	The height of the inlet should be in between 1.5 – 1.8 m from the ground and the sampler should stand alone firmly at erected position
<i>Sampling time</i>	Operable for at least 28 hours in one sampling cycle
<i>Time Totaliser</i>	0 to 9999.99 hours. Time-totaliser circuit detects blower stoppage due to any reason.
<i>Automatic Sampling</i>	24 hour programmable timer to automatically shut-off the system after pre-set time intervals.
<i>Overall size</i>	430 x 320x 930 mm or smaller and 45 Kg or lighter in weight.
<i>Power Supply</i>	230 ± 10 V AC; 50 Hz ± 3%

### **Gaseous Sampling Attachment**

<i>Flow Rate</i>	0 - 2 LPM (Least count 0.05 LPM)
<i>Flow Control</i>	Four inlet and one outlet manifold with built in needle valves with locking facility for flow control of each inlet for running all types of impingers viz. Fritted, Midget and Muenke
<i>Sampling Train</i>	4 Nos. of 50 ml Borosilicate glass midget impingers kept in ice tray

(2) RESPIRABLE DUST SAMPLER (PM<sub>2.5</sub>) WITH GASEOUS SAMPLING ATTACHMENT

<i>Sampler</i>	Manual filter based sampler, conforming to USEPA Manual Reference / Equivalent Method
<i>Flow rate</i>	Fixed, 1m <sup>3</sup> /hour (16.7 lpm) controlled by Mass Flow Controller. The performance criteria shall be restricted to the requirement at par with FRM
<i>Elapsed time indicator</i>	Up to 99.99 hours
<i>Vacuum pump</i>	Suitable pump for providing the designed flow rate, brushless motor, Pulse dampers has to be in-built if any pulsating pump is provided.
<i>Flow recorder</i>	Memory based recording, downloadable to computer through suitable port and data cable with manual display on screen. All the data should be retrievable through RS 232 and or USB. Should have capability to store at least 20 - 30 previous sampling data in memory.
<i>Dry gas meter (Volume totalizer)</i>	Calibrated volume totalizer capable to display instantaneous volume passed.
<i>Volumetric Flow</i>	Ambient temperature and pressure sensors to control volumetric flow rate
<i>Power requirement</i>	230 □ 10 VAC, □ 10, 50 Hz 0.5 Amp. max.
<i>Size Selective inlets</i>	Opposed jet impaction for PM <sub>10</sub> cut and Very Sharp Cut Cyclone / WINS impactor for PM 2.5 Cut off. The Sampler Should have facility to use as PM <sub>10</sub> Sampler with WINS bypass down tube.
<i>Height of the Inlet</i>	The height of the inlet should be in between 1.8 - 2 m from the ground and the sampler should stand alone firmly at erected position

## The Sampler Design Criteria

1. The Sampler shall be designed as per specification of USEPA reference samplers approved as Federal Reference Method (FRM) as mentioned in appendix L of 40 CFR part 50 along with relevant data logging and retrieval system. The system shall be designed in accordance with the drawings and the deviations must be stated while bidding.
  2. The Material of Construction for the components shall be strictly anodised aluminium only
  3. The connectors shall be push fit type with engraved groove for gaskets at male parts. Screw system for joints should be avoided.
  4. The tolerances specified for PM10 impactor L14 of appendix L of 40 CFR part 50, PM2.5 Impactor and L21 of appendix L of 40 CFR part 50 shall be strictly applicable.
  5. Filter loading mechanism and filter holder assembly shall be designed in user friendly way and sufficient space must be provided to ensure proper handling of filter.
- 3) AUTOMATIC METEOROLOGICAL PARAMETER MONITORING INSTRUMENT CAPABLE OF MEASURING WIND SPEED, DIRECTION, RELATIVE HUMIDITY AND TEMPERATURE
- (a) *Micro controller based data logger with Supported Sensors of:*
- Wind Speed – range 0 to 100 Km/hr.
  - Wind Direction – range 0 to 360 degrees with 1 degree resolution
  - Temperature & RH – range 0 to 50 C with resolution of 0.1 C and 0 to 100% RH with 1% resolution.
  - Rainfall – range 0 to 50 mm/hr with 0.5 mm resolution.
- (b) *Memory Capacity* : Forty five days storage of all parameters in non-volatile flash memory.
- (c) *Real Time Sync* : Built-in battery backed Real time clock ensures data is synchronized with real-time even after periods of prolonged power failure.
- (d) *Data Access* : Built-in firmware supports land-line and GSM Modems for remote data access. Can be interfaced directly to a standard RS232 (COM) Port of a PC for data transfer.
- (e) *Software* : Windows XP compatible, for data download to a PC and analysis supporting communication via PSTN, GSM modems and direct

cable connection to RS232 / USB ports. Analysis tools should include export to MS Excel, Graphs, Monthly Averages & Windrose Diagrams.

- 4) *Power Requirement* : Rechargeable battery pack that can keep the system operating for about at least 15 hours / Solar Panel based charger.

4) ANALYTICAL BALANCE (ELECTRONIC)

- a) It should be top Loading Electronic Balance
- b) Readability: upto 4 & 5 digits (0.0001g and 0.00001g)
- c) Weighing range : 100 gms or more
- d) Taring facility : Entire range
- e) Reproducibility: 0.0001 gm
- f) Linearity: +0.0002 gms
- g) Stabilization time : Approx. 2 seconds
- h) Power supply: Should operate on (220 +10) volts 50 HZ AC power supply
- i) Pan diameter : 80 mm-100 mm
- j) Other requirements : It should be provided with plastic draft shield, calibration weights, manual and dust cover.

5) HOT AIR OVEN

Inside chamber size of the two ovens, small and big size should be within the range of

- (a) 600-650 mm x 900-950 mm x 600-650 mm
- (b) 450-500 mm x 450-500 mm x 450-500mm, respectively

The Ovens should be double walled with inside wall made of thick Anodized Aluminium/ Stainless Steel and outside wall made of mild steel furnished in durable white enamel paint. The space between the walls should be atleast 75 mm thick and packed with pure white glass wool. Heating elements should be located at appropriate locations to enable temperature controls through a build- in air circulating fan and thermostat arrangement from room temperature to 250<sup>0</sup>C. Should have a build-in digital thermometer and 2 adjustable air ventilators located near the top of the sides. The ovens should operate on 230±10 volts : 50HZ AC power, with timer (upto at least two hours and adjustable in multiples of 15 minutes or less) for auto cut offs. The ovens should be complete with pilot lamp, digital display (continuous) facility for temperature, at least three perforated shelves adjustable at any levels, power cable and plug.



6) SPECTROPHOTOMETER (VISIBLE)

- (1) *Wavelength Range* : 340 to 960 nm
- (2) *Wavelength Accuracy* : Better than 2 nm at 365 nm and 546 nm
- (3) *Wavelength Readability*: Better than 1.0 nm
- (4) *Wavelength Repeatability* : Better than 1 nm
- (5) *Spectral Slit width* : 10 nm
- (6) *Photometric readout* : Digital display selectable for transmittance (T), absorbance (A), or concentration (C), and A to C conversion factor (concentration factor).
- (7) *Photometric range* : 00.0 - 100 in T  
0.000 - 1.980 in A  
0.000 - 1980 in C
- (8) *Photometric Noise* : Less than 0.1 % T near 100% T  
0.001 near 0.00 A  
0.002; near 1.00 A
- (9) *Photometric Linearity* : Better than 0.2 % T at display and analog output.
- (10) *Photometric Accuracy* : Better than 0.3 % T (0.003 A at 0.4 A) at digital display.
- (11) *Long term Drift* : 0.003 A per hour
- (12) *Zero Drift* : Less than 0.1 % T per day
- (13) *Accessory output* : Analog in %, T. 1 volt (adjustable), RS.232C
- (14) *Power Requirement* : (230 ± 10) volts/50 Hz AC operated

7) DESSICATOR

- (a) *Size (Internal)* : Internal Diameter 30 cm for circular and 25 cm x 30 cm or more for rectangular (Must be able to desiccate 20.3 x 25.4cm filter paper without folding)
- (b) *Operation* : Operated with Vacuum

8) A. WHATMAN GF/A FILTER PAPER FOR PM<sub>10</sub> MONITORS

1. *It should be Glass Microfibre Filters:*

- manufactured from 100% borosilicate glass, be binder free and can be used at temperatures up to 550°C.
- Filters should have fine particle retention and high flow rate, as well as good loading capacity.
- These filters should meet the requirements of IS 5182 (Part1): 2006, “Methods for Measurement of Air Pollution – Dust Fall”
- Filters should be manufactured via a Quality System certified to ISO 9001 and tested in accordance with documented quality procedures.
- Filters should have size of 18x10 inches.

2. *Filters should have:*

- Particle Retention in Liquid: 1.6  $\mu\text{m}$
- Air Flow Rate: 4.3s/100ml/in<sup>2</sup>
- Nominal Thickness: 260 $\mu\text{m}$
- Nominal Basis Weight: 53g/m<sup>2</sup>
- Wet Burst: 0.3psi
- Tensile M/D Dry: 5.5N/15mm
- Maximum Recommended Temperature: 500 °C
- Minimum retention efficiency in air:  $\geq 99.85\%$  @ 0.3 $\mu\text{m}$
- Typical retention efficiency in air:  $\geq 99.99\%$  @ 0.3 $\mu\text{m}$
- Typical Water Flow Rate: 143 mL/min

B. WHATMAN PTFE FILTERS (47 MM) FOR PM<sub>2.5</sub> MONITORS

(a) PTFE membrane should be of high purity, sequentially numbered & chemical resistant support, free from any adhesives & glues.

(b) Filters should meet the requirements of 40 CFR Part 50, Appendix L & should be manufactured in a facility that maintains a Quality Management System (QMS) registered to the ISO 9001:2008 standard.

(c) They should be useable for ambient air monitoring/PM 2.5 Sampling & having low tare mass for accurate gravimetric determinations and should have:

- Diameter of  $\sim 47$  mm with supported ring ( $46.2 \pm 0.4$  mm)
- Pore size of 2.0  $\mu\text{m}$  as measured by ASTM F 316-94 or similar
- Thickness of 30 to 50  $\mu\text{m}$ .
- pH neutral and Density  $\sim 0.5$  mg/cm<sup>2</sup>, Pressure drop @ 16.67 LPM  $\sim 30$  cm H<sub>2</sub>O or less (ASTM D 2986-95a or similar).
- Weight stability: Filter weight loss shall be less than 20  $\mu\text{g}$  (average change in weight of 50 filters).
- Aerosol retention (collection efficiency) greater than 99.7 percent, as measured by the DOP test (ASTM D 2986-91) with 0.3  $\mu\text{m}$  particles at the samplers operating filter face velocity or 16.67 L/min air flow rate
- Support ring media: polymethylpentene (PMP) or equivalent inert material.
- Support ring thickness  $0.38 \pm 0.04$  mm
- Moisture pickup: not more than 10  $\mu\text{g}$  wt. increase after 24 h exposure to air of 40% RH, relative to wt. after 24 h exposure to air of 35% RH.
- Pressure drop (0.3  $\mu\text{m}$ ) @ 16.67 L/min: 30 cm H<sub>2</sub>O column (max)

(d) The filter should be USEPA approved/certified for ambient PM sampling.

(e) These should pass the Test for loose, surface particle contamination.

### 3. TERMS AND CONDITIONS

- 2) The Quotation should be submitted in a sealed envelope and superscribed on the cover as **“Quotations for supply of Laboratory equipments/instruments to the Mizoram Pollution Control Board”**, addressed to the Member Secretary, Mizoram Pollution Control Board, Mizoram New Capital Complex, Thlanmual Road, Khatla, Aizawl, Mizoram-796001.
- 3) The Quotations should reach the office of the Mizoram Pollution Control Board on or before 12:00 P.M of 30<sup>th</sup> August 2019. Late or delayed Quotations shall not be entertained in any case and the Board does not assume any responsibility on postal delay in case of submission of the Quotation by post.
- 4) Quotations shall be opened on 30<sup>th</sup> August 2019 at 2:00 P.M. in presence of the Quotationers, if desired to be present.
- 5) Earnest money amounting to Rs. 10,000/-(Rupees ten thousand) in the form of Deposit at Call/Fixed Deposit in original from any Nationalized Bank of India, duly pledged in the name of Member Secretary, Mizoram Pollution Control Board, Aizawl, Mizoram must be submitted alongwith the Quotations. The Earnest money deposit in respect of the unsuccessful bidder will be released after selection is finalized. Selected Firm must supply the materials within the time as may be specified in the Supply order, failing which the Earnest money will be forfeited alongwith cancellation of supply order.
- 6) Quotations must be submitted in the prescribed form only, as attached in the annexure Rates should be clearly quoted in terms of Indian Rupees, in figures as well as in words FOR Mizoram Pollution Control Board, Mizoram New Capital Complex, Thlanmual Road, Khatla, Aizawl, Mizoram - 796001 and should be inclusive of all taxes, duties, freight and other charges. The quoted rates must be valid for 90 days from the date of submission of the Quotations. All pages of the quotations should be signed, stamped and dated. Corrections if any, should be made clear without overwriting and should be initialed.
- 7) The Quotationers should furnish valid up-to-date Tax clearance certificate and duly attested Photostat copies of valid GST registration certificate, distributorship/dealership certificate/authorization letter or manufacturer’s certificate as the case maybe. Original Certificates should be produced at the time of opening of the quotations, if demanded.

- 8) Payment will be made only after the items are received in full and in good condition, followed by complete installation and demonstration which are to be free of cost or inclusive in the Net quoted price of the item. There shall be no advance payment and no such request shall be entertained.
- 9) Warranty and after sales maintenance offered by the Manufacturing company should be clearly mentioned for the quoted item.
- 10) If any Quotationer violates and fails to fulfill any of the above mentioned requirements, his or her Quotations will be liable to be rejected at the time of opening of the tender.
- 11) Acceptance of the lowest rate is not obligatory. The instruments shall be selected on the basis of its reliability and viability, not only from the quoted rate and the Board reserves the right to reject any/all of the Quotations without assigning any reason thereof.
- 12) The Board has the power to revoke the supply order for unsatisfactory performance or for any other reason any time during the contract.
- 13) In case of any legal disputes and litigations arising out of this Quotation Notice, the matter will be heard and settled in the court of law at Aizawl only.

**Annexure**

**FORMAT FOR SUBMITTING QUOTATIONS**

<i>Sl. No.</i>	<i>Item</i>	<i>Make/ Brand/Model</i>	<i>Company's specifications</i>	<i>Unit price (Rs.)</i>	<i>Taxes (Rs.)</i>	<i>Other charges, if any. (Rs.)</i>	<i>Net quoted price (Rs.)</i> (5+6+7)		<i>After sales maintenance</i>	<i>Warranty</i>	<i>Enclosures</i> (yes/No)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i> (figures)	<i>9</i> (words)	<i>10</i>	<i>11</i>	<i>12</i>
											1. Earnest money deposit 2. Distributorship/Dealership certificate/authorization letter/manufacturer's certificate 3. Literatures/Catalogues of the quotes item(s) 4. Tax Clearance & GST registration Certificate 5. Any other (please mention)