

Two Bid Tender Document

**Purchase of Equipment for FRI**



**Forest Research Institute  
P.O. New Forest  
Dehradun-248006**

**2010-11**

Sl.No.-----

**PURCHASE SECTION  
FOREST RESEARCH INSTITUTE  
P.O. New Forest,  
DEHRADUN-248006**

**TENDER NO: X-8/10-11 /Purchase dated 8.7.2010**

**DUE DATE FOR PRE-BID CONFERENCE: Aug. 2, 2010 at 11:00 Hrs, venue Purchase office, FRI (Main Building)**

**DUE DATE FOR SUBMISSION OF TECHNICAL & FINANCIAL BIDS: Aug, 13, 2010 at 10.00 A.M.**

**DUE DATE FOR OPENING OF TECHNICAL BIDS: Aug, 13, 2010 at 11.00 A.M.**

**OPENING DATE FOR FINANCIAL BIDS: Aug 23, 2010 at 11.00 A.M.**

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**CONTENT OF TENDER PAPER**

THIS PAPER INCLUDES THE FOLLOWING DOCUMENTS:-

1. Tender Notice (Chapter I)
2. Terms & conditions (Chapter -II)
3. Description of the items, specification (Chapter III)
4. Schedule of Price(Chapter IV)
5. Agreement (Chapter V)
6. Format for Bank Guarantee (Chapter VI)

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**Issued to M/S**

**(PIAR CHAND)  
Purchase Officer**

**Purchase Section  
Forest Research Institute,  
ICFRE, P.O. New Forest, Dehradun-248006  
BIDDING DOCUMENT**

**Chapter-1 Instructions to Bidders**

Sealed Tenders are invited from the reputed firms for the purchase of following items for this Institute:-

Sl.No.	Tender No.	Name of the Equipments	Earnest Money
1.	NO.X-8/10-11/Purchase	1. PCR Machine	10000
		2. Gel doe System	15000
		3. Electrophoresis (Horizontal)	2000
		4. Ice flakes Maker	2000
		5. Micro & Mini centrifuge	2000
		6. Deep freezer	8000
		7. Water Purification System	10000
		8. HBIAC Measuring Machine	2000
		9. Design, fabrication & installation of 30 meter tower for Large Aperture Scintillometer and its installation to be supplied by SAC.	50000
		10. Universal Testing machine.	15000

The details of the above items and other Terms and Conditions, etc. are available in the tender documents, obtainable from the Purchase Officer, Forest Research Institute, Dehradun-248006, on payment of **Rs.227.00 (Rs.277.00, if tender is required by Speed post)** (including **13.5%** Utranchal Trade Tax), by **CROSSED DEMAND DRAFT** in favour of the **Accounts Officer, FRI. Pre-bid Conference** for finalization of technical specifications has been arranged at the Institute premises on **Aug 2, 2010 at 11:00 Hrs.** The Tenders (both technical and financial bids) should reach this office on or before **Aug 13, 2010 up to 10.00 A.M.**, out of which the **technical bids** will be opened on the same day at **11.00 A.M.** in the presence of the tenderers or their authorized representatives, if any. Any or all tenders can be rejected by the Director, FRI without assigning any reason. The tender forms and specifications are also available at web site <http://fri.icfre.gov.in/>. The tender form downloaded from above web sites must include Rs.227/- as tender fee along with the tenders submitted.

**Purchase Officer  
Forest Research Institute**

To  
M/s

## Chapter-2: Conditions of Contract

### Terms and Conditions

**Pre-bid conference:** A pre-bid conference has been arranged with the users for finalization of technical specifications of the equipment. Bidders are requested to take part in the Pre-bid conference at scheduled date and time. The modified specifications, if any, after Pre-bid conference will be available at the websites and also can be obtained from the office of Purchase officer. After Pre-bid conference no changes will be accepted in the desired specifications. If no party attends the Pre-bid conference then listed specifications will be considered as final.

**The proposals must consist of three separate sealed envelopes as follows:**

The **First envelope** must enclose following documents and must be marked in bold letter as “QUALIFYING DOCUMENTS & EMD”

- a. A brief description of the organization and an outline of recent experience in assignments of a similar nature.
- b. Proof of registration with Directorate of Industries or equivalent,
- c. Proof of Sales Tax Registration,
- d. PAN.
- e. EMD will be as follows (liable to be forfeited if wrong information is furnished)

<b>Name of the Equipments</b>	<b>Earnest Money</b>
1. PCR Machine	10000
2. Gel doe System	15000
3. Electrophoresis (Horizontal)	2000
4. Ice flakes Maker	2000
5. Micro & Mini centrifuge	2000
6. Deep freezer	8000
7. Water Purification System	10000
8. HBIAC Measuring Machine	2000
9. Design, fabrication & installation of 30 meter tower for Large Aperture Scintillometer and its installation to be supplied by SAC.	50000
10. Universal Testing machine.	15000

- f. The bidding firm must possess an experience of at least five (05) years, in the field of supply, support and maintenance of the equipment. (Enclose copies of the supportive documents OR supply orders).

The **Second envelope** must enclose the Technical proposal and must be marked in bold letter as “TECHNICAL PROPOSAL”.

The **Third envelope** must enclose the Financial proposal and must be marked in bold letter as “FINANCIAL PROPOSAL”.

### **TECHNICAL PROPOSAL**

During the preparation of technical proposal, in addition to technical details of the equipment along with **original catalogue and other literature**, the tenderer must give particular attention to the following:

- i) Users list and supportive documents from the users for the satisfactory performance and after sales service.
- ii) Information about suitably trained technical staff along with well established service network must be furnished.
- iii) On hand training proposal for the staff of the Institute at site.
- iv) All specifications should be certified and guaranteed for genuineness and that the model of the equipment is not going to be obsolete in near future (supportive documents from the Principal to be enclosed).
- v) Availability of spares/parts for next five years to be ensured (supportive documents from the Principal to be enclosed).
- vi) In absence of original catalogue and other literature the tender would be considered as invalid.

### **SUBMISSION OF PROPOSAL**

Financial and Technical Proposals and an envelope containing the qualifying documents and EMD should be sealed in three separate envelopes and then sealed in a counter envelope. The proposals should be clearly distinguished by writing on the cover "Qualifying Documents", "Financial Proposal" and "Technical Proposal". The outer envelope must be clearly marked "DO NOT OPEN EXCEPT IN PRESENCE OF THE EVALUATION COMMITTEE" and "TENDER FOR EQUIPMENT".

The proposal must contain no interlineations or overwriting except as necessary to correct errors made by the concerned themselves, in which cases such corrections must be initialed by the person or persons signing the proposal. Your completed proposal must be delivered on or before the stated time and date.

### **PROPOSAL EVALUATION**

A three-stage procedure will be adopted in evaluating the proposals

- (i) Checking of qualifying documents. This will be the first envelope, which shall be checked, and disqualification amongst these documents will lead to rejection of the proposal *in toto*,
- (ii) A technical evaluation of the qualified firm on the basis of the qualifying documents will be carried out prior to opening the financial proposal,
- (iii) A financial evaluation. Firms will be ranked using a combined technical / financial score as indicated below.

### **Technical Proposal**

The evaluation committee appointed by the client will carry out its evaluation applying the evaluation criteria and point system as specified below. Each responsive proposal will be attributed a technical score (St.).

The points given to technical evaluation criteria are

i)	Firms relevant experience (including similar jobs in hand)	15
ii)	Technical specifications of the equipment	70
iii)	Service life/spares availability	15
<b>Total</b>		<b>100</b>

The technical proposal should score at least 70 points out of 100 to be considered for financial evaluation.

### Financial Proposal

The evaluation committee will determine if the financial proposals are complete and without computational errors. The lowest financial proposals (Fm) will be given a financial score (Sf) of 100 points. The financial scores of other proposals will be computed as follows  $Sf = 100 \times Fm/F$  (Where F is amount of financial proposal).

Proposal will finally be ranked according to their combined technical (St) and financial (Sf) scores using the formula  $S = St \times T\% + Sf \times F\%$ .

The weight (T%) given to the Technical Proposal is 60%

The weight (F%) given to the Financial Proposal is 40%

### General Terms & Conditions

The offer will be subject to the following terms and conditions: -

1. Please note that FRI, Dehra Dun has Custom Duty Exemption and Excise Duty Exemption Certificate. This may be kept in consideration while quoting the rates.
2. The stores are required to be delivered in full and within 90 days after acceptance of the offer.
3. The offer should be firm and open for acceptance till 120 days from the stipulated date of opening. Price escalation will not be allowed.
4. Full details of business terms and conditions, e.g. packing and forwarding, delivery period, VAT/Sales Tax/Trade Tax (whether provincial or Central), other Taxes/Charges, if any, the validity period of quotation, discount, free delivery, packing or any other information relevant to the items may please be indicated clearly.
5. Full specifications, details and information regarding the articles to be supplied, such as make, size, etc. along with **original catalogue**, etc. to be furnished with the offer. The list of users of goods of similar or same nature in the country should also be enclosed. The offer would not be considered fit if these details are not provided.
6. Normal terms of payment will be 100% payment within 30 days after receipt and acceptance of goods in satisfactory working condition after installation. Other terms of payment should be clearly spelt in the offer.
7. The tender should accompany a DEMAND DRAFT/FDR of **value as specified in Clause e of Chapter 2 (EMD)** as Earnest Money, payable to the Accounts Officer, Forest Research Institute, Dehradun, which will be refunded, without interest, if the offer is not accepted. In case the offer is accepted but not honored by the tendered; the Earnest Money will be forfeited. The Earnest Money will also be forfeited, if wrong information is given in the tender to influence the tender cost.
8. The Tenderer should also specify regarding Dealership/Proprietary item and copy of the latest certificates from the principal should be produced with the tender.
9. Freight, forwarding charges, if any, should be mentioned in the offer. In case of import being done by this institute, the FOB prices should be mentioned.
10. The stores are required to be delivered to the consignee concerned and the consignee will do inspection and verification of the goods.
11. The tenderer should quote on their printed letter-head paper, indicating thereon Sales Tax/Trade Tax No., Registration No., Fax No., Telex No., Telephone No., E-mail, etc.

12. **Two year on site comprehensive WARRANYTY** for all the items and works to be given OR ( **as specified in specifications**)
13. **Performance Bank Guarantee:** The supplier will have to submit a PBG or Performance security in the form of Bank Guarantee or FDR @ 5% of total order value from a commercial bank in an acceptable form within 21 days of issue of supply order. Performance security should remain valid for a period of 24 months beyond the date of completion of all contractual obligations of the supplier including the warranty obligations. Failure to abide by the contractual obligation will liable to forfeit the Performance Bank Guarantee.
14. Any or all tenders can be rejected by the Director, FRI without assigning any reason. It cannot be challenged in any court.
15. Disputes, if any, will be under the jurisdiction of Dehradun Court, Uttranchal, India.

**(PIAR CHAND)**  
**PURCHASE OFFICER**

## CHAPTER III (Description of the items and specifications)

### Final Specifications of the Equipments after Pre-bid Conference.

#### 1 PCR Machine

- Sample capacity 96 x 0.2 ml PCR tubes or 77 x 0.5 ml PCR tubes or 1 x 96 –well PCR plate
- Temperature-control range 4 °C to 99 °C
- Temperature distribution across the block:
  - 20 °C to 72 °C =  $\pm 0.6$  °C
  - 95 °C =  $\pm 1.0$  °C
- Block homogeneity
  - 20 °C to 72 °C =  $\pm 0.4$  °C
  - 95 °C =  $\pm 0.5$  °C
- Regulation accuracy per well  $\pm 0.2$  °C
- Ramping Rate
  - Approx. 3 °C/s or higher (heating)
  - Approx. 2 °C/s or higher (cooling)
- Freely programmable temperature gradient over 12 rows
- A gradient range of up to 20 deg C
- No. of programs 100 on device; approx. 10 on personal card
- Max. no. of cycles 99
- Should have compatible for *in situ* adapter for *in situ* PCR application.
- A copy of PCR Licensed certificate.

#### 2 Gel Doc System

##### CAMERA WITH ZOOM LENS:

12 Bit Camera or higher  
Pixel Resolution 1360 x 1024 pixels,  
1.4 Megapixels or higher

##### UV TRANSILLUMINATOR :

Mid range UV source of 302 nm  
Filter size suitable for large gels (around 60x 96cm)  
Should have UV blocking cover.  
And provision of White light conversion  
For viewing ethidium bromide DNA gels, coomassie blue stained gels, silver stained protein gels, autoradiographs and microtitre plates.

##### DARKROOM ENCLOSURE :

Should fit on the Transilluminator around 60 x 36 x 96cm  
Uniform overhead White Light Illumination,  
Safety door with Auto UV ON/OFF.



Gel viewer window allowing visualization of samples without door opening

Interchangeable single position filter slider

**IMAGE ACQUISITION & ANALYSIS SOFTWARE : VISIONWORKS LS**

Image acquisition with live preview with image enhancements  
Automatic Image optimization, Annotation and Intensity Calibration.  
DVP (Digital Video Playback),  
Analysis : 1D MW Calibration, 1D lane Densitometry  
Live Animal & plant Imaging, Measure Molecular weights, protein

Quantitation,

Quantitative PCR, Dot Blot Analysis, Colony Counting, Western Blot ,  
GFP expression analysis, PCR gene expression, TLC analysis and more  
Report Generator & Dynamic Data Exchange of Results to Excel,  
Automated Macros for Repetitive Procedures,  
Support for 21 CFR part 11 compliance

**COMPUTER COMPATIBLE FOR ABOVE SYSTEM :**

Pentium 4 Processor (3.0 Ghz), 80 GB Hard drive, 512 MB RAM, 52X CD-  
RW,

Keyboard, Mouse, serial /parallel/ USB ports, pre-loaded with Windows XP  
professional,  
17" Colour Monitor and Inkjet printer

**3 Electrophoresis (Horizontal)**

- Gel Size:10x11.5cm gel
- Capacity : 80 samples or more
- 450ml buffer volume
- Gel should be “pivot – cast” directly in unit
- UV transparent tray
- Mini Horizontal unit
- With removable Gel Casting Tray
- Should include UV tray, 2x1.0 mm, 16-well combs)
- Scoop for 10 cm wide gels
- Colored loading strip

**4 Ice flakes Maker**

- Corrosion free exterior and interior
- Continuous production of ice throughout the day
- Environmental friendly CFC free cooling
- Micro processor based temperature control
- PUF insulation.
- Reliable
- Energy Efficient
- Sturdy Construction
- Low Maintenance
- Light Weight

- Maximum Production : 90-100 kg / Day.
- Quality compressor & Air Cooled condensation CFC/HCFC Free. (R134a)
- Storage Capacity of bin : 25-30 kg
- Type of ice : flakes
- Interior and Exterior are made of corrosion resistant material.
- Easy Extraction system
- Energy Efficient
- Automatic low water cut off system
- Automatic full storage cut off system
- Provided with geared motor with over heating and over voltage protection
- Production start time : 10-15 mins
- Provided with castor wheels for easy movement.

### **5 Micro & Mini centrifuge**

- Maximum speed 14,000 -16000 rpm/16,000 g aprox.
- Complete with 18 or 24 x 1.5/2.0 ml rotor
- Brushless, maintenance-free motor
- Should have a quick button for momentary run
- Should have continuous flow of ambient air through the rotor chamber to keep the rotor and samples cool

### **6 Deep freezer**

- Air-cooled cascade refrigeration system (2) 1 hp air-cooled compressors.
- Temperature range -20°C. to -86°C
- 100% HFC CFC-free refrigerants. Efficient downfeed evaporator.
- High capacity air-cooled condenser.
- Capacity: 11.8 cubic feet or above.
- Eye-Level Control Center
- Large Storage Capacity
- CFC-Free,HFC-Free Refrigerants
- CFC-Free Polyurethane Insulation
- Quick- Pull –Down and recovery Time
- Microprocessor Control Precision.
- Low Power Consumption
- Automatic Alarm System Dependability
- Heavy gauge steel cabinet with long lasting powder paint finish

### **7 Water Purification System**

A Two-stage purification 5 micron and 1 micron polypropylene graded density wrapped type depth filter with low voltage 20 watts powered DC pump with noise levels of 50 Db prefilter should be attached with tap water.

System should have an Iron removal filter of out put level 0.1 ppm iron content as a separate pretreatment unit

A continuous demineralized system should be attached with it having the following specification  
 Stage 1: Pretreatment cartridge with anti-scaling compound, silver impregnated activated carbon and 3micron and 1 micron filter.

Stage 2: A High flux thin film RO membrane with 100Dalton cutoff and compatible with feed water quality of SDI upto 12 and free chlorine level of 3 ppm and conductivity of 2000us. System should have a conductivity meter before and after RO membrane to monitor percentage rejection.

Stage 3: Self-regenerating Electro-de-ionization module with mixed bed ion exchange resin, should have carbon bead at cathode and should not have conditioning cartridge before EDI.

Stage 4: A UV lamp of 254 nm for Bacterial reduction.

Monitoring: Coaxial resistivity cell, with cell constant  $0.01\text{cm}^{-1}$  & auto test resistivity measurement

Unique temperature feed back pump with temperature compensation to  $0.1^{\circ}\text{C}$  for consistent flow rate irrespective of temperature changes

System should have an in built display to ensure the system operating parameters are displayed at all times.

System should have Auto diagnostic facility with Error No and Alarm code for easy maintenance along with auto rinse facility.

At this stage the water quality should be Resistivity of 10-15 Megohm.cm, TOC levels less than 30 ppb and Bacteria level of  $< 1$  cfu /ml, Flow rate 3 L/hr.

Blow molded cylindrical conical bottom PE reservoir with 30 L capacity with sensor rod float switch and single 3 stage vent filter consisting of soda lime and activated carbon and 0.65 micron hydrophobic membrane.

A final ultra pure water purification system connected with the tank should have the following specification

Stage 1: Should have separate feed water specific purification cartridge and application specific polishing cartridge. The cartridge flow path should have UPFLOW in purification step and DOWNFLOW in polishing step.

Stage 2: Should have a placed dual wavelength (185 & 254nm)

Stage 3: Should have a ultra filtration cartridge for pirozen removal

Stage 4: Final filters 0.22 micron PVDF, stacked disc validated membrane.

Monitoring:

Resistivity cell should have a cell constant of  $0.01\text{ cm}^{-1}$  with auto test facility with coaxial design. The system should have alphanumeric back lit display, auto diagnostic features with error numbers and alarm codes for easy maintenance

Final product water having Resistivity of 18.2 Meg ohm .cm, TOC $< 5$  ppb, Bacteria  $<1$  cfu/ml, Pyrogen  $<0.001$  Eu /ml , Flow rate 1.5Lt/min is delivered by point of use dispenser with rocker arm, volumetric dispensing and auto shut

### **8 HBIAC Measuring Machine:-**

Fully Automatic	
Sample Volume:	4 ul
Test Range:	4.0-14.0%
Reading Time:	5 minutes
Memory capacity:	200 test results
Power required:	DC 9 V-1.5 A
Dimension/Weight:	200*200*139 (mm)/ 1.4 kg
Operating Temperature:	17-32 degree C (63-90 Degree F)
Relative Humidity Range:	10%-90%
Date download:	USB port
Option:	Thermal Printer.

**9 Designing, fabrication & installation of 30 meter tower for Large Aperture Scintillometer and installation of scintillometer to be supplied by SAC.**

**(Design, and installation of 30m tower)**

**Guyed and open lattice type 30 meter tower**

1. Tower Height : 30 Meter
2. Mounting Facility : It should be vibration free. It should have provision for mounting  
the following things
- Sensors : (a) LAS-Instrument at the top of each 30 m tower  
(b) Sensors air temperature, relative humidity and wind speed-wind direction sensors with total weight of 5 kg at 29 m height for receiver tower only
- a. Accessories needed at : (a) A metal circular platform base of 50 cm diameter is  
each tower top to fix the LAS transmitter (35 cm X 23 cm x 32 cm with weight 15 kg) and receiver (35 cm x 23 cm x 32 cm with weight 15 kg)  
(b) Three solar panels (30 cm x 30 cm x 30 cm each) weighing total 10 kg for both towers  
(c) Battery with box with 30cm x 30cm x 30cm dimension weighing 25 kg each on both the towers
- b. Cable Connection : Extra Cables  
(a) LAS Receiver to Data Logger  
(b) LAS Receiver to Battery and Solar Panel  
(c) Sensors to Data Logger  
(d) Solar Panel to Battery at LAS Receiver Tower  
(e) LAS Transmitter to Battery and Solar Panel  
(f) Solar Panel to Battery at LAS Transmitter Tower
3. Design bases Wind : 65 m/s
4. Each Section Length : 6 Meter
5. No of Sections : 05 Nos
6. Angle : ISA 65 x 65 x 6
7. Lacing Member Size : ISA L 35 x 35 x 5
8. Lacing Angle : 45 Deg.
9. Horizontal Lacing Angle : ISA L 35 x 35 x 5
10. Foundation : Base Square 600 mm
11. Guy Supported Levels : 3 Guy Levels
12. Guy Levels : At 6, 18 and 30 Meter
13. Guy Rope Dia : 012 mm
14. GI Nuts and Bolts : As per IS : 1367 – 1979
15. Wind Loading : As per IS : 875

16. Design Specification : As per IS : 800
17. Minimum Breaking Load : 140 Kg f mm<sup>-2</sup>, Cf 1.2
18. Platform : At 26meter (inside) and 30 meter (outside)
19. Size of Platform : 1500 x 1500 mm
20. Gate and Fencing : to be erected for protection
21. Ladders : Inside the tower alternating with slanting and horizontal bins  
Constituted of thick mesh
22. Aviation Lamp intensity : An automatically operable aviation lamp with sufficient  
meeting the aviation warning standards to be installed at 30m with suitable clamps. The automatic twilight sensor and control unit for the same is to be installed at suitable location in the campus.
23. Lightening Arrestor meter : A lightening arrestor with spiked copper rod of at least 1  
height should be installed at the top of the tower and connected to an earth pit with copper bars and suitable copper cable. The earth pit should confirm the relevant IS specifications.
24. Cable Routing junction : Provision for cable routing from instrument booms /  
boxes to the bottom of the tower will be provided. The cable bunch has to run in a flexible PVC pipe / with equivalent arrangement from top to the lower end of the tower and into the instrument enclosure installed not very far from the tower.
25. Finishing and Protection galvanized : The steel structure to be hot dip galvanized. All Steel  
sections like L angles, flats, tubular sections, bolts and nuts etc. shall be given a coat of Zinc Phosphate primer over a coat of ETCH primer. Synthetic enamel paint of two coats shall be applied over the above. The color scheme to confirm to the aviation warning colors of orange and white for every 6meter sections.

Complete design of tower and layout has to be submitted along with technical bid.

### 10 Universal Testing Machine:-

Capacity 50 KN, Range 1-50 KN, Load Resolution 1/10,000 Local measurement accuracy  $\pm 1\%$  within measuring range (2-100% of load capacity), Displacement resolution 0.01mm,  
**Speed drive-** (i) A.C. Servo drive having better than 1% accuracy (ii) Ball screw (a) Test speed range 0.1 mm/min to 300 mm/min continuously variable (b) speed accuracy  $\pm 1\%$  of set speed, (c) cyclic test (static rating) frequency 0.5 Hz. Max.  
**Clearance:** Vertical clearance e minimum 1200 mm, Horizontal clearance minimum 600mm,  
**Sensor:** (i) Two digital displacement Gauges with data output range 50 mm, resolution 0.01mm(ii)Two rotary encoders with 0.01mm resolution- Easy clip-on gauges/sensors system for

measuring single and dual averaging differential movement on opposite sides of the jointed specimen.

**Display:** (i) Load, Displacement, Extension/Deformation (ii) Individual, Average/Differential deformation (when two external displacement sensors being used).

**Software:** PC based control & measurement, Machine control software for tensile, compression & cyclic test ( test mode-displacement)

Recording & Plotting of real time load-displacement curve upto 100 cycles, suitable accessories for static and cyclic test.

PC ( Branded DELL/Hp/Lenova) with printer and training for two person.

Calibrated fro load, speed and movement.

(PIAR CHAND)  
PURCHASE OFFICER

**Chapter-4: Price Schedule**

(To be utilized by the bidders for quoting their prices)

<b>Item with detail specifications</b>	<b>Cost per unit</b>	<b>Taxes, if any</b>	<b>Total cost in figure and words</b>

**Name/Seal of the Tenderer**

**Chapter-5: Agreement**

The Supplier \_\_\_\_\_ agrees to accept the terms and conditions of this bidding document in letter and spirit.

**Name/Seal of the Tenderer**

## Chapter-6: Format for Bank Guarantee

To

Forest Research Institute  
P.O. New Forest  
Dehradun

Your Order No. \_\_\_\_\_ for the supply and delivery of \_\_\_\_\_ has been accepted by M/s \_\_\_\_\_.

In accordance with the terms of payment of the said order, we have agreed to pay the balance of 5% of the contract price of the supplier, furnishing you with an acceptable Performance Bank Guarantee for 5% of the total contract value, viz Rs. \_\_\_\_\_ for the due performance by the Supplier of all its contractual obligations and to be valid for a period of 24 months for the date of bank guarantee for this purpose you have agreed to accept our guarantee.

In consideration thereof, we hereby guarantee payment of and undertake to pay Rs. \_\_\_ and remit to you on demand and without demur the sum of Rs. \_\_\_\_\_ being 5% of the total value of the contract on receipt of your intimation that the Supplier has committed a breach of any of its contractual obligations.

This guarantee shall be valid for a period of 24 months from the date of Installation of the equipment in satisfactory condition or 27 months from the date of dispatch of the last lot of consignment whichever is earlier, and in any event shall expire on \_\_\_\_\_, you shall have the right to file/make your claim on us under the guarantee for a period of sixty days from the said date of expiry.

This guarantee shall not be revoked without your express consent and shall not be affected by your granting time or any other indulgence to the supplies or by any change in the constitution of the Bank or the supplies or for any other reason whatsoever.

Not with standing any thing, contained herein above our liability under this guarantee is restricted to Rs. \_\_\_\_\_ and this guarantee will remain in force up to and inclusive of \_\_\_\_ - unless an action to enforce a claim under the guarantee is filed against us within sixty days from the date of expiry i.e. on or before \_\_\_\_\_, all rights under the guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

**Signatory Bank with Seal**



## **Pathological Mist Chamber:-**

### **Specifications:-**

**Size;** LxBxHcentre:s 20'x15'x10'

**Normal tube light** (04)

**Control units for :- Temperature  $\pm 1^{\circ}\text{C}$**  (01)

**Humidity  $\pm \text{RH } 4\%$**  (0!)

**Waterpad cooling system:** Exhausts 18" with HD motor fixtures and a 200 litre polymer watertank to distribute and collect water from pad, lowers by  $8^{\circ}\text{C}\pm 2^{\circ}$  at outside max.62% RH (subject to ambient  $35^{\circ}\text{C}$  or above) or low, (01 set)

**Heating system** by electric heat convector great system 24 KW (02)

**Timer Piltz** for humidity (01)

**Misting unit heavy duty** motor with nozzles, filter, pipes etc., to raise RH upto 90%, provided humidity created is not expelled from the mist chamber (o1)

**Polycarbonate sheet** double walled 6mm thick, UV stabilised with geeignet gaskets for sides & roof, set. (Complete set)

**Roof Screen** 75% (shading0 colour green, black available, manually operated (Complete set)

**Super Structure module aluminum** anodized covering strip infra **structure Mainly GI pipe** 47mmx47mm  $\pm$  mm door size 1.92x.91 m (normally 6'-3"x3') lockable (Complete set)

**Benching** 2'6" high, wide 2'6". Mild steel rust resistant. 7'-9" long  
Foundation wll for greenhouses

WIDE BASED 1' below earth' surface, 1' above earth's surface, as kick-board 9" wide. Frame base Block height 2'. **Floor** made of crushed bricks 4", over that 'rodi' upto 2" over that cement plaster with ratio of rodi, sand, cement 4:3:1. (Complete set)

**Electrical wiring** of entire greenhouse. (Complete set)

**Miscellaneous** Plumbing polymer pipes etc. All fittings of ISI or equivalent material (set 1)

## **BOD INCUBATOR:-**

(650x580x900 MM)

W d h

With EDT controller- 5 degree -50 degree C range -0.5 degree C, sensitint, from ED voltmeter. Double walled inside anodized aluminum and outside mild steel painted in epoxy coating 220/280 volt A.C. electronic digital readout feminge and interior illumination, unbreakable acrylic door inside. Preferably an ISI 9001:2000 manufacturer.

## **SPECIFICATION FOR CHEMICAL REACTOR WITH AGITATOR**

**(a) Operational requirement:** The equipment is required for acid/alkaline hydrolysis of wood dust or woody materials.

- (b) Technical requirements:**
- (i) Capacity 10.0 L  
Minimum stirrable volume-0.5 L
  - (ii) Working pressure  $12 \text{ kg/cm}^2$
  - (iii) Temp. Range: ambient to  $300^{\circ}\text{C}$
  - (iv) M.O.C. Acid/alkali resistant material at elevated temperature
  - (v) Heating; external electrical ceramic band heater with FLP junction box and insulation.
  - (vi) Stirrer; 4/6 bladed for turbine stirrer 100-1450 rpm variable speed
  - (vii) Motor & drive : Flame proof AC Motor with variable frequency drive and digital RPM

- indication
- (viii) Shaft Sealing; Zero leakage Magnetic drive coupling
  - (ix) Standard fittings; Pressure gauge, vent valve, flush bottom valve, safety valve, internal cooling coil, thermowell with PT-100 temp. sensor, gas inlet valve, liquid sampling valve etc.
  - (x) Gasket; Teflon with split clamp type quick opening system.
  - (xi) Control Panel; Microprocessor based P.I.D. temp. controller with LCD display and motor speed controller.
  - (xii) Mounting; .S.S. movable trolley.
  - (xiii) Test pressure; Body hydrotest shall be 1.5 times of working pressure.
  - (xiv) Main power supply; Single phase, 220 VAC, 50 Hz.
  - (xv) Provision of loading and unloading of materials.

**Terms and Conditions:**

- Installation and operation of equipment.
- All necessary prerequisite for installation.
- Two years on site comprehensive warrantee.

**Rates for AMC after warrantee period:**

Rates for AMC after warrantee period should also be quoted separately.

**tissuelyser / homogenizer :-**

specifications

1. The equipment must be capable of homogenizing hard samples like wood / bark tissues. It should also be capable of homogenizing various other kinds of tissue for purpose of DNA extraction.
2. The homogenizer should be capable of handling up to 192 biological samples or more.
3. Programmable to provide variable speeds from 3 to 30 Hz (180–1800 oscillations/minute) and run times from 10 seconds to 99 minutes.
4. Should include adapter sets for 2 x 96 collection microtubes (1.2 ml) or 2 x 24 microcentrifuge tubes (2 ml) as well as stainless steel and tungsten carbide beads.
5. For disruption of large samples, 10 ml grinding jar sets with stainless steel or Teflon grinding balls are also needed.
6. Adequate safety features
7. At least two year warranty
8. Demonstration for training for handling at the time of installation

**POWER CHAIN SAW:-**

## Weighing Machine (Manual): -( for heavy logs)

In the continuation of the indent for the purchase of Image Analyze, it is to mention that the equipment with the specifications supplied to your esteemed section is utmost important for the division to develop the images of individual clones / genotypes of *Dalbergia sissoo* . The equipment will even be useful for other species being undertaken by the Division for such studies. The equipment with following details may please be purchased,

The system should include both software and hardware for capturing high resolution images for microscopic and macroscopic studies. The system should also include capturing device for recording and analyzing 3 D morphological observation such as floral / seed characters. The software for analysis of digital image should include wide applications for forestry and plant science research area,

- a. Area measurement
- b . Quantification of colour
- c . Estimation of damaged areas on leaf / petals etc.
- d . Root area measurements
- e . Canopy related measurements
- f . Karyotyping and other cellular measurements