

Department of Chemistry
MNIT, Jaipur
CORRIGENDUM

Tender No. No. F5(766)ST/MNIT/Chy/2019

A pre-bid meeting was held on 17.01.2020 to address the queries of the tenders. After discussion department has finalised below mentioned modifications in the technical specifications of the equipment of above-mentioned tender. Below mentioned revisions may please be considered. for details visit: www.mnit.ac.in, <https://eprocure.gov.in/epublish/app> & <http://tenderwizard.com/MNITJ>

Original Specifications	Revised Specifications
<p>Item No. 1. Tubular Furnace (1700 °C): 1 no.</p> <ul style="list-style-type: none"> ▪ Type: Horizontal Tube Furnace ▪ Control zone: Single ▪ Maximum operation temperature (°C): 1700 ▪ Continuous working temperature (°C): 1600 for long duration ▪ Gas purging/Vacuum/Both: Both ▪ Hot zone OD × ID × L (mm): 60 × 50 × 250 ▪ Rate of heating: Up to 10 °C per minute ▪ Construction: MS Body fabricated from 12" and 14" MS sheet, Powder coated for superior finish. Double layer steel body with outer fan cooling for low surface temperature and long life of refractory ▪ Tube/Flange support: Yes ▪ Skin temperature at 1500 °C: < 60 °C ▪ Number of cooling fans: 2 ▪ Number of air filters: 1 ▪ Heating element type: U Shaped MoSi₂ heating elements ▪ Thermocouple type and number: R Type 24 CWG housed in protective High Alumina Tube, One number (for control and safety) ▪ Temperature control system with auto tune function: Phase angle fired Thyrister based, driven by Programmable (PID) profile controller (1 program of 30 	<p>Item No. 1. Tubular Furnace (1700 °C): 1 no.</p> <ul style="list-style-type: none"> ▪ Type: Horizontal Tube Furnace ▪ Control zone: Single ▪ Maximum operation temperature (°C): 1700 ▪ Continuous working temperature (°C): 1600 for long duration ▪ Gas purging/Vacuum/Both: Both ▪ Hot zone OD × ID × L (mm): 60 × 50 × 250 ▪ Rate of heating: Up to 10 °C per minute ▪ Construction: MS Body fabricated from 12" and 14" MS sheet, Powder coated for superior finish. Double layer steel body with outer fan cooling for low surface temperature and long life of refractory ▪ Tube/Flange support: Yes ▪ Skin temperature at 1500 °C: < 60 °C ▪ Number of cooling fans: 2 ▪ Number of air filters: 1 ▪ Heating element type: U Shaped MoSi₂ heating elements ▪ Thermocouple type and number: R Type 24 CWG housed in protective High Alumina Tube, One number (for control and safety) ▪ Temperature control system with auto tune function: Phase angle fired Thyrister based, driven by Programmable (PID) profile controller (1 program of 30 steps) ▪ Current limit + feedback: Yes

steps)

- **Current limit + feedback:** Yes
- **Temperature control resolution:** ± 1 °C
- **Power rating Maximum:** 4.5 KW, single phase, 230 Volts, 25 amps
- **Over temperature protection:** Yes
- **Hot zone tube 99.5% Alumina tube of OD \times ID \times L:** 60 \times 50 \times 1000 (± 3 mm)
- **Flanges SS flanges with double silicone O-ring for gas purging and Vacuum:** Yes
- **Provision for vacuum working in flange:** Yes
- **Provision for gas flow control in flange:** Yes
- **Number of silicone o-rings in a flange:** 2
- **Number of radiation shield:** 2 number fibrous ceramic blocks
- **Sample placement rod SS rod to place sample at center of hot zone:** Yes

Warranty: One year on-site

- **Temperature control resolution:** ± 1 °C
- **Power rating Maximum:** 4.5 KW, single phase, 230 Volts, 25 amps
- **Over temperature protection:** Yes
- **Hot zone tube 99.5% Alumina tube of OD \times ID \times L:** 60 \times 50 \times 1000 (± 3 mm)
- **Flanges SS flanges with double silicone O-ring for gas purging and Vacuum:** Yes
- **Provision for vacuum working in flange:** Yes
- **Provision for gas flow control in flange:** Yes
- **Number of silicone o-rings in a flange:** 2
- **Number of radiation shield:** 2 number fibrous ceramic blocks
- **Sample placement rod SS rod to place sample at center of hot zone:** Yes

Warranty: 3 years on-site

Item No. 3. Centrifuge Machine: 1 no.

- **Maximum capacity:** 6 × 50 ml (fixed angle)
- **Maximum speed:** 16000 rpm (fixed angle)
- **Setting RPM:** Yes
- **Setting RCF:** Yes
- **Display RCF:** Yes
- **Timer:** 00:30 to 99:50 (mm:ss) and continuous mode
- **Date and Time:** Yes
- **Acceleration levels:** 0–9 (0 = min – 9 = max)
- **Deceleration levels:** 0–9 (0 = min – 9 = max)
- **Spin function:** Yes
- **Programs:** 10 programs with protection function
- **Indication of rotor:** Yes
- **Noise:** ≤ 55 dB

Warranty: One year on-site

Item No. 3. Centrifuge Machine: 1 no.

- **Rotor 1: Maximum Capacity:** 6 × 50 ml (fixed angle)
- **Rotor 2: Maximum Capacity:** 24 × 2 ml (fixed angle)
- Instrument should be supplied with Rotor 1 and Rotor 2 with suitable centrifuge tubes
- **Maximum speed:** 16000 rpm (fixed angle)
- **Setting RPM:** Yes
- **Setting RCF:** Yes
- **Display RCF:** Yes
- **Timer:** 00:30 to 99:50 (mm:ss) and continuous mode
- **Date and Time:** Yes
- **Acceleration levels:** 0–9
- **Deceleration levels:** 0–9
- **Spin function:** Yes
- **Programs:** 10 programs with protection function
- **Indication of rotor:** Yes
- **Noise:** ≤ 55 dB

Warranty: 1 year on-site

Item No. 4. ROTAVAPOR WITH VACUUM CONTROLLER, ALONG WITH VACUUM PUMP AND RE-CIRCULATING CHILLER. QTY. 2 NOS.

SPECIFICATIONS FOR ROTAVAPOR

- Motorized lift with provisions for automatic lifting of the flask in case of power failure.
- Rotation speed up to 280 rpm or better with microprocessor controller and clockwise as well as anticlockwise rotation.
- Digital bath temperature display of both set and actual temperature simultaneously with microprocessor control ranging from ambient to 90 °C with an accuracy of ± 2 °C. There should be provision to set and lock the bath temperature or better
- Automatic over heat cut-off protection
- Provisions to remove water bath without removing the electrical connections of the water bath.
- Evaporating flask from 50-3000 ml can be used on the same joint adapter without additional connections.
- Bath capacity: 4 litres or more
- Vertical Glass Assembly with cooling surface area of 1200-1500 cm²
- 1 liter Evaporating Flask and Receiving Flask should be provided in standard scope of supply.
- All glass components should be made of Borosilicate 3.3 glass or better
- Should be supplied along with condensate trap, splash adaptor and connecting adaptors with various sizes of evaporating flask (50, 100, 500, 1000, 2000 and 3000 ml; 5 units each)

Item No. 4. ROTAVAPOR WITH VACUUM CONTROLLER, ALONG WITH VACUUM PUMP AND RE-CIRCULATING CHILLER: QTY. 2 NOS.

Specification for Rotavapor

- Motorized lift with provisions for automatic lifting of the flask in case of power failure.
- Rotation speed up to 280 rpm or better with microprocessor controller.
- Digital bath temperature display of both set and actual temperature simultaneously with microprocessor control ranging from ambient to 90 °C or higher with an accuracy of ± 2 °C. There should be provision to set the bath temperature
- Automatic over heat cut-off protection
- Evaporating flask from 50-1000 ml can be used on the same joint adapter without additional connections.
- Bath capacity: 4 liters or more
- Vertical Glass Assembly with cooling surface area of 1200-1500 cm²
- 1 liter Evaporating Flask and Receiving Flask should be provided in standard scope of supply.
- All glass components should be made of Borosilicate 3.3 glass or better
- Should be supplied along with condensate trap, splash adaptor and connecting adaptors with various sizes of evaporating flask (50, 100, 500 and 1000 ml; 3 units each)
- **Warranty:** One year on-site

Vacuum Controller

- Vacuum controller with control knob and large graphic display screen.
- Integrated solvent database for convenient setting of distillation conditions
- Repeat function for reproducible repetition of a distillation
- Speed control for vacuum pump.

- SPECIFICATIONS FOR VACUUM CONTROLLER

- Vacuum controller with control knob and large graphic displayscreen.
- Integrated solvent database for convenient setting of distillationconditions
- Repeat function for reproducible repetition of adistillation
- Speed control for vacuumpump.
- Measuring range: 1000-0 mbar orbetter
- Control range: 900-0 mbar orbetter
- Integrated aeration valve and precision pressuresensor.
- Timer function for process termination after pre-specifiedtime
- Provision for display of Chiller temperature andcontrol.

- SPECIFICATIONS FOR VACUUM PUMP

- Single/double stroke Speed control vacuum pump with a flow rate of 1.5-2 m³/h orbetter
- Ultimate vacuum – less than 10 mbar orbetter
- 2 stage diaphragm made ofPTFE
- Noise-free vacuumsystem
- Warranty: One year onsite

RE-CIRCULATING CHILLER

- Temperature Range: -20 °C or lower toambient
- Pump Capacity: 3 liters/min at 0.6 bar or better

- Measuring range:1000-0 mbar or better
- Control range: 900-0 mbar or better
- Integrated aeration valve and precision pressure sensor
- Timer function for process termination after pre-specified time
- Provision for display of chiller temperature and control

Vacuum Pump

- Single/double stroke Speed control vacuum pump with a flow rate of 1.5-2 m³/h or better
- Ultimate vacuum: 12 to 10 mbar or better
- 2 stage diaphragm made of PTFE
- Noise-free vacuum system
- **Warranty:** 1 year on-site

Re-Circulating Chiller

- Temperature Range: –10 °C or lower to ambient
- Pump Capacity: 3 liters/min at 0.6 bar or better
- Coolant: CFC Free
- Closed loop with external circulation
- Safety Features: Breaker for leakage and excess current, overload relay maintaining circuit, circulating pump protection, self-check function for temperature controller.
- Refrigeration unit: Air cooled
- Bath capacity: 3-4 liters or better
- Warranty: One year on site The equipment should be provided with all necessary accessories and spare parts for a fully functional unit
- List of consumables and spare parts along with operation and service manuals should be provided along with the instrument.

Note: The Rotavapor with Vacuum Controller, Vacuum Pump and Re-Circulating Chiller should be from the original manufacturer

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| <ul style="list-style-type: none">▪ Coolant: CFCFree▪ Closed loop with external circulation▪ Safety Features: Breaker for leakage and excess current, overload relay maintaining circuit, circulating pump protection, self-check function for temperature controller.▪ Refrigeration unit: Air cooled▪ Bath capacity: 10 litres or better▪ Warranty: One year onsite▪ The equipment should be provided with all necessary accessories and spare parts for a fully functional unit. List of consumables and spare parts along with operation and service manuals should be provided along with the instrument. | |
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Item No. 6. Microwave Reactor: 1 no.

Heating Rate: 2 – 6 °C/second or better

Temperature: (-80 – 300) °C with volume-independent temperature measurement

Pressure: 35 bar (515 psi or more)

Reflux Reactions: 5 – 125 mL size round bottom flask or better

Operating Volume: 5 – 10 mL (pressurized) upgradable up to 50 ml

Power: Minimum focused power output of 300 watts or more, system should be monomode

Magnetron Frequency: 2450 MHz

Reaction Agitation: Electromagnetic stirring with adjustable speeds

System Control: Infra-red temperature option control and pressure sensor control as well

Accessories:

- a) Pressurize vessels of following specifications should be offered
 - 1. Volume: 10 ml
 - 2. Pressure: 35 bar (515 PSI) or more
 - 3. MOC: Glass
 - 4. No of Vessels: 100 No
 - 5. Vessel should be of vent & reseal technology
 - b) Normal pressure reaction vessels: 100 ml glass vessel. At least 3 nos.
- Upgradability:** System must be upgradable for following .
- a) for sub ambient temperature from -80 deg to 300deg
 - b) for gas purging

Item No. 6. Microwave Reactor (Monomode): 1 no.

Heating Rate: 2-6 °C/second or better

Operating Temperature: RT to 250 °C with temperature measurement facility

Operating Pressure: 20 bar or better (upgradable)

Reflux Reactions: Reflux reaction with 5-125 ml size round bottom flask which can be done on main instrument or through an accessory which should be supplied with the instrument

Operating Volume: 5 – 20 mL (pressurized) or better

Power: Minimum focused power output of 300 watts or more, system should be working in monomode

Magnetron Frequency: 2450 MHz or better

Reaction Agitation: Electromagnetic stirring with adjustable speeds

System Control: Infra-red temperature option control and pressure sensor control as well

Accessories:

- a) Pressurize vessels of following specifications should be offered
 - 1. Volume: 10 ml and 30 ml
 - 2. MOC: Borosilicate Glass
 - 3. No of Vessels: 100 No. each (for 10 ml and 30 ml)
 - 4. Vessel should be of vent & reseal technology
 - 5. The instrument should be supplied with 10 ml and 30 ml reaction vessels (10 nos. each) made up of SiC.
 - b) Normal pressure reaction vessels: 100 ml glass vessel (5 nos.)
 - c) The instrument should be supplied with Reflux condenser with suitable glassware.
- Warranty:** 3 years on-site (on parts and labor)

c) 80 ml or above pressurize reaction vial & accessories

d) Upgradability for Peptidesynthesis

Warranty: One year on-site (on parts and labour)

Item No. 7. FT-IR Spectrometer: 1no.

- Standard Wavenumber Measurement Range: (6,000-500)cm⁻¹
- Wavenumber Accuracy: at least ± 0.05 cm⁻¹ or better
- Maximum Spectral Resolution: 0.8 cm⁻¹ or better
- Interferometer: Must be rock solid permanently aligned and highly stable
- Beam Splitter: ZnSe (high humidity resistant)
- Detector: DLATGS
- Signal-to-Noise Ratio: 50,000:1 or better at resolution 4cm⁻¹
- Spectroscopy Software: Windows based system with facilities like Instrument control, Basic and advanced data manipulation routines, Spectral calculator, quantification etc.
- Warranty: 10 years warranty on Interferometer & 5 years warranty on Laser & Source

Item No. 7. FT-IR Spectrometer: 1 no.

- Standard Wavenumber Measurement Range: (6,000-500) cm⁻¹ or better
- Wavenumber Accuracy: at least ± 0.05 cm⁻¹ or better
- Maximum Spectral Resolution: 0.8 cm⁻¹ or better
- Interferometer: Must be rock solid permanently aligned and highly stable
- Beam Splitter: ZnSe (high humidity resistant)/KBr
- Detector: DLATGS
- Signal-to-Noise Ratio: 30,000:1 or better at resolution of 4 cm⁻¹ or better
- Spectroscopy Software: Windows based system with facilities like Instrument control, Basic and advanced data manipulation routines, Spectral calculator, quantification etc.
- Warranty: 10 years warranty on Interferometer & 5 years warranty on Laser & Source

The instrument should be supplied with online UPS (1kVA) and PC with software control, printer, pellet press and agate mortar

<p>Item No. 8. Fluorescence Spectrometer: 1 no</p> <p>Light source : 150 W Xenon Lamp, should be shield house</p> <p>Wavelength Range : Ex: 200 nm – 850 nm or better Em: 200 nm – 900 nm or better</p> <p>Optical system : Monochromator with Advanced Grating Photometric ratio system using monochromatic light to monitor the intensity</p> <p>Sensitivity : Signal to Noise Ratio should be 3500:1(RMS, water Raman) or better.</p> <p>Spectral Band width : minimum should be 1nm for both excitation and emission monochromators and should variable adjustment to 2.5 nm,5 nm,10 nm, 20 nm</p> <p>Resolution : should be 2 nm (at 546.1nm) or better</p> <p>Wavelength Accuracy : should be ± 2 nm or better</p> <p>Wavelength Scan Speed : Should be Variable in the range from 20 - 20,000 nm/minFor both excitation & emission monochromators</p> <p>Automatic cut off Filter :for higher order diffraction to be provided</p> <p>Detector : PMT</p> <p>Automatic Gain control: standard.</p> <p>Should have provision to measure Fluorescence and Phosphorescence as standard.Should have start button for starting measurement immediately after placing the sample for kinetic measurements.</p> <p>Optional Accessory Identification : should be Automatic</p>	<p>Item No. 8. Fluorescence Spectrometer: 1 no</p> <p>Light source : 150 W Xenon Lamp, should be shield house</p> <p>Wavelength Range : Ex: 200 nm – 850 nm or better Em: 200 nm – 900 nm or better</p> <p>Optical system : Monochromator with Advanced Grating Photometric ratio system using monochromatic light to monitor the intensity</p> <p>Sensitivity : Signal to Noise Ratio should be 3500:1(RMS, water Raman) or better.</p> <p>Spectral Band width : minimum should be 1nm for both excitation and emission monochromators and should variable adjustment to 2.5 nm,5 nm,10 nm,20 nm</p> <p>Resolution : should be 2 nm (at 546.1nm) or better</p> <p>Wavelength Accuracy : should be ± 2 nm or better</p> <p>Wavelength Scan Speed : Should be Variable in the range from 20 - 20,000 nm/minFor both excitation & emission monochromators</p> <p>Automatic cut off Filter :for higher order diffraction to be provided</p> <p>Detector : PMT</p> <p>Automatic Gain control: standard.</p> <p>Should have provision to measure Fluorescence and Phosphorescence as standard.Should have start button for starting measurement immediately after placing the sample for kinetic measurements.</p> <p>Optional Accessory Identification : should be Automatic</p> <p>PC Communication : USB</p> <p>Software Functions : Compatible with Windows and should have various data acquisition mode,(Spectrum measurement (Ex, Em</p>
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PC Communication : USB Software Functions : Compatible with Windows and should have various data acquisition mode,(Spectrum measurement (Ex, Em Mode),Quantitative measurement, Fix Wavelength Mst,Time Course Mst, 3D spectrum ,Phosphorescence easurment, Self Diagnosis) Power compliance: 230V, 50 Hz Quartz cuvette (10*10 mm) : 1 Nos Cell Holder: :Liquid, Solid Sample & Powder Sample. Standard Warranty : 1 Year Installation & Training : at sight Future Upgradable Optional Accessory should be Quoted.	Mode),Quantitative measurement, Fix Wavelength Mst,Time Course Mst, 3D spectrum ,Phosphorescence Measurement, Self Diagnosis) Power compliance: 230V, 50 Hz Quartz cuvette (10*10 mm) : 1 Nos Cell Holder: :Liquid, Solid Sample & Powder Sample. Standard Warranty : 1 Year Installation & Training : at sight Future Upgradable Optional Accessory should be Quoted. The instrument should be supplied with online UPS (2kVA) and PC with software control and printer
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Our E-Tender Dated: 03.01.2020 which was scheduled to be opened on 27.01.2020 has further been extended upto 07.02.2020 (Friday)

However the time of bid submission/ opening and all other terms & conditions of earlier E-NIT will remain unchanged.

Deputy Registrar
(Store & Purchase)