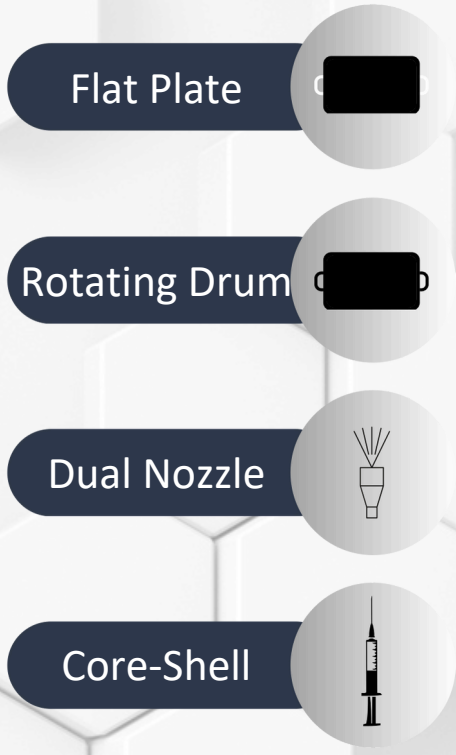
Electrospinning unit



Process Attributes:

- Parallel and perpendicular infusion and collector setup.
- System to facilitate Dual-Polymer matrix and scaffold with individual controls.
- Bi-component and core-shell ultrafine fiber fabrication facility.
- Liquid Media fibrous sheet collection
- Adjustable Substrate to nozzle distance from 50-250 mm with in process control

Power Supply Requirements:

- The power supply accept an input voltage of 220–240 VAC ± 50 Hz.
- Output voltage ranging from 0 to 30 kV ± 0.05% for precise electrospinning operations.
- Voltage adjustment 0.05-0.1 kV increments to ensure fine control.
- The output current range from 0 to 400 µA
- The system equipped with a microprocessor-based controller for reliable and programmable operation.
- The voltage output continuously adjustable from zero to the maximum output value.
- An overload trip function, where the unit will shut down if the current exceeds 20% of the maximum rated output.
- The power supply an auto-cut safety feature, disabling high voltage output when the chamber door is opened.

SPECIFICATION

Infusion Control Requirements:

- The infusion system support generic/glass/PTFE solution containers with piston.
- Dual infusion channels with digital control.
- Infusion rates settings user friendly and isolated channels.
- Accommodate volumes ranging from 5 microliter to 20 ml.
- The infusion rate adjustable between 1 microliter/min and 3 ml/min, with an accuracy of ±0.05%.
- MOC: Non-conductive Ultra high molecular weight materials with non-corrosive metal parts (SS316).
- A microprocessor-based control system to achieve precise and programmable flow regulation.
- Infusion repeatability proven and OEM calibration certificate will be provided.
- The system control over volume, time, and infusion rate as standard functionalities.

Substrate Requirements:

- Stationary Random Matrix conductive substrate 220x150mm +-5mm
- Rotating Substrate collector for Aligned fiber matrix. Size 80x150 mm
- Precise speed regulation from 100-6000 RPM.
- Easy mandrel changing facility to incorporate different size mandrels.
- MOC: SS316.
- PTFE lining sheet for non-fibrous collection at bottom

Spinneret Requirements:

- Single Nozzle and Dual-Nozzle for conventional spinning process.
- Nozzle Diameter from 0.2 mm.
- Capillary based high throughput nozzle for ultrafast and ultrafine fiber spinning.
- Co-Axial Spinning with needle changing and ultrafast cleaning mechanism
- MOC: SS316

Motion actuators Requirements:

- In process X-Y axis controls.
- Automated X-Axis and Y-Axis control.
- Y-axis control automated via switch operation for flexible alignment.
- The Z-axis support manual distance adjustment.
- Z-axis will be removable while not using vertical spinning.
- Provision to setup camera for seeing real-time spinning on PC

Spinning Chamber Requirements:

- The chamber equipped with a digital temperature and humidity display to continuously monitor process conditions.
- An exhaust fan with an n-HEPA filter to effectively remove harmful chemicals and vapors generated during operation.
- The chamber include a white LED tube light of 10 watts to provide adequate illumination during spinning.
- A 10-watt UV light integrated for sterilization or additional functional requirements.
- The system support under-solvent spinning to enable specific nanofiber fabrication processes.

Control Panel Requirements:

- The control panel included an Emergency Stop button to immediately halt all operations in case of any hazard or malfunction.
- A Power Light to indicate system status during operation.
- Contamination sterilisation facility
- The panel include an Exhaust Fan Speed Regulator for adjusting ventilation as per process needs.
- A Main ON/OFF button for controlling the overall power supply to the system.
- X-Axis and Y-Axis Control Switches to enable manual or semi- automatic control of stage movement along respective axes

Accessories:

- 1 box of standard syringes (3 ml or 5 ml) with needles
- Standard spinning samples (PAN, PVDF)
- Allen key set
- Screwdriver set
- Insulation/foot pad
- Warranty: Minimum 3 years

NOTE: This these specification can be changed as per tender specification