

TECHNICAL SPECIFICATIONS-IVC SYSTEM FOR MICE:

Individually Ventilated Caging System to house laboratory mice including cages, racks, Air Handling Unit and other essential accessories (autoclave, cage changing station, UV pass box to be procured together)

Specification for the cages:

1. Minimum Floor area should be approximately 540 cm², to be able to accommodate 7 adult mice in one cage.
2. The cages must be individually ventilated and be able to run in both positive and negative pressure modes which can be changeable via the control panel.
3. The cage body must be Symmetrical to work using both the cage sides without any specific orientation.
4. The Cages should be made up of Polysulphone material with a minimum of 3 years warranty.
5. The cages must be Air-proof with a nylon gasket between the top and the cage body.
6. The Cage top should have externally integrated notch for a water bottle (water bottle capacity not less than 250ml), microbiological filter (filtration efficiency ~99.5% for <0.3 microns particle size) valves at supply and exhaust for air ventilation with the inlet and outlet nozzles should not protrude into the cage to prevent cross –contamination by animals. The inlet and outlet nozzles should positioned to rear top part to protect the animals from air draft and resulting behavioural changes.
7. The bottle caps on water bottles must have been made from welding free Stainless steel (ASI 316) to maximize water availability.
8. Air speed within the cage should be lower than 0.2 m/sec.
9. Air changes per hour (ACH) inside the cage at all levels should not vary much from the mean ACH value (+/-15%) and removal of cages from a rack should not affect the distribution of the air supply to the remaining Cages in the rack. Third Party regulatory agency validation is a must.
10. All components of the cages must be autoclavable and washable.
11. The cages must be provided with autoclavable plastic cage card holder.

Specification for the racks:

12. Double Sided Rack should be able to hold 120 - 130 mouse Cages/Rack – 4 Racks (Approximate Size :1650x880x2000mm). It should be able to introduced into the facility through doors measureing about H6.5' X W3.5'.
13. Single sided Rack should hold at least 60 – 70 mouse Cages/Rack- 2 Racks (Approximate Size : 1650x512x2000mm). It should be able to introduced into the facility through doors measureing about H6.5' X W3.5'.
14. Rack should be fitted with vertical plenums for inlet and outlet air nozzles (demountable for sanitization) for individual cages.
15. Vertical plenum should allow bedding and debris to get dislodged by gravity (avoiding plenum clogging and debris accumulation) to through vacuum and should allow dismounting for wash and sanitization without any use of tools.
16. The stainless steel rack structure should be of AISI 304 with plastic runners.
17. Proper cage Lids on the rack and visual indicators for cage docking should be there.
18. Racks should have heavy duty, autoclavable Polyphenylsulfone construction castors for easy mobility – to withstand autoclaving -low maintenance- free and with breaking system.
19. The rack runners should have system for proper cage stopping and silent locking to avoid agitating the animals during these maneuvers.

20. The horizontal plenums for air supply and exhaust should not have luminal acute angles or corners to prevent accumulation of dust and to allow equal air distribution.

Specification for air handling unit:

21. The Air Handling Unit should be controlled by any portable or fixed device that is equipped with a web browser, irrespectively of the Operating System it runs and displays all the AHU information in the tablet/mobile phone/PC screen.
22. AHU with DC motors must ensure consumption of very low power and low heat loss with consequent low running costs.
23. Both supply and exhaust airstream should be HEPA filtered.
24. AHU should allow at least 75 Air Changes per hour to each individually ventilated cage.
25. Each AHU should be able to connect to 4 single –sided racks or 2 double-sided racks . Settings for the number and the type of cages should be programmable at the any portable device.
26. AHU itself should be equipped also with a touch panel that displays the main information such as the performance monitoring device, the alarm status and the connection status of the linked devices.
27. The AHUs should not transmit any vibration to the connected racks.
28. AHU width should not more than 16 inches
29. AHUs must have rust-free polymer and 304 stainless steel structure. AHUs should have steel ball bearing castors and Polyphenylsulfone construction wheels with breaking system for easy mobility and positioning.
30. There should be a Microprocessor controlled panel for setting and controlling airflow velocity, air changes frequency, and temperature and humidity sensors.
31. Supply and exhaust HEPA filters must have necessary test certification.
32. There should be a Dry contact for alarm integration with the building management software.
33. The Noise level must be < 50 dba,
34. The pre-filters must be easily accessible with no tools needed for their change.
35. Regulatory agency Certification is preferred
36. The AHUs should be able to perform provide reports for the following tests:
 - A) Aeraulic tests (both in positive and negative pressure mode)
 - B) DOP filter integrity test
 - C) Electrical integrity
 - D) Sensors calibration for temperature and humidity

General Requirements:

1. Manufacturer should have standard certifications (ISO 9001 and ISO 14001).
2. The total system compliance with regulatory guideline tested by third independent party.
3. The Specifications mentioned in the offers must cover all technical parameters listed in our enquiry with proper supporting documentations. Unspecified technical specifications to be considered non-compliant.
4. The principal/local agents are responsible for delivery/loading/unloading of material.
5. Installation, testing, checking of specifications and the validation should be done at the specified area.
6. Training of users to be done free of cost at the site, in at least two workshops.
7. The spares parts and necessary consumables for the IVC system should be available for at least 10 yrs after installation.
8. Utility requirements for installation and running of the system should specified in the offer itself to check for institutional feasibility. Requirements that are not feasible in the institute at the specified site may disqualify the offer.

9. Local service support and response time for a service call during and after the warranty should be specified.
10. List of academic users in India (at least 3 required) and abroad (at least 5 required) of the similar models as the one(s) offered along with the names, addresses, telephone numbers and mail ID's to be enclosed separately. Previous installations in CSIR laboratories will be preferred. For Indian manufacturers foreign installations may not be required.
11. Technical presentation and demonstration on the systems offered is to be made on request from CSIR-IICB. In case any of the invited parties fails to demonstrate their compliance as per the demanded specifications, the party will be treated as disqualified.
12. Safety certification from regulatory agencies must be provided, e.g. ISO or any other Govt. regulatory agencies.

Technical specifications for the autoclave:

- 1) The autoclave should be a Horizontal Rectangular with Double Door, with concealed portion of Jacket of M.S. Quality. The autoclave should be semi- automated and the inner chamber volume of the autoclave should be at least 450 Litres and preferably cubical in shape.
- 2) The autoclave should have the following working parameters: Chamber working Pressure of 1.2 Kg/Cm², Jacket Working Pressure 1.5 Kg/Cm², Chamber Working Temperature 121^o C.
- 3) The autoclave should have Hydro Test of Chamber One & half time the working Pressure. Whereas Jacket should have Twice the working Pressure and Steam Generator should have Twice the working pressure
- 4) The Sterilizing Chamber must be fabricated from S.S.316 Quality with argon welding. Chamber should have with rounded corners for easy Cleaning with at least 2 % slope for full Draining. A Steam Baffle should be provided at the back of Chamber. The Chamber has to be provided with a Compound Gauge.
- 5) The Concealed portion of jacket is to be fabricated from M.S. Quality. The Jacket should help in reinforcement as well as temperature uniformity in the sterilizing space. The Jacket should have a safety Valve and Pressure Gauge on Operating Side.
- 6) The Multiport valve / Individual Switch of the autoclave should be fitted for the process of complete cycle of Sterilization.
- 7) The Sterilizer should be mounted on a tubular stand of S.S.304 Quality. Control Panel should be fabricated from S.S.304 Quality. The Sterilization Chamber should have double-hinge type doors made of S.S.316 Quality. Locking Assembly & Radial Arms should be made up of S.S.304 (Door opening/closing manually). The Door Sealing should be through Silicon Door Gasket.
- 8) Operator Safety: The Autoclave should have a) Process lock to prevent opening of the door during the process. b) automatic self-pressure locking device by a special clutch to prevent it from being opened under pressure. The door should open only when the pressure comes to zero.
- 9) All piping of the autoclave should be made of S.S. 304 Quality with full argon welding. All connection used should be threaded. The pipeline should have at least 2% slope for full draining.
- 10) The autoclave should be provided with a 0.2-micron vacuum break filter on sterile side.
- 11) A baffle needs to be provided in the autoclave for effective distribution of steam throughout in the chamber & to avoid the entering steam from directly hitting onto the load.
- 12) Chamber condensate line should be incorporated with steam traps and check valve for perfect condensation and to achieve optimum temperature.
- 13) Validation ports for inserting sensors during Process Qualification should be present.
- 14) The autoclave should have the ejector systems to create partial vacuum which helps in quick drying.
- 15) The Control cabinet of the autoclave should have main isolator for the three-phase supply and a separate switch for the control supply. All cabling should be flexible; all cablings for temperature signals should be shielded.
- 16) The steam Generator of the autoclave should be made of S.S. 304 sheet with industrial immersion heaters with 18 kw Load. The steam generator should be provided with

automatic pressure control & other safety features like low-water cut-off to safe guard heaters, safety Valve gauge glass etc. All other necessary inlet, outlet & Drain connection with valves should be provided.

17) The vendor must clearly state the type of Civil, Sanitary and Electrical utilities to be required for the installation of autoclave in the facility .

Technical specifications fro the UV Pass Box:

1) Inner dimension of the pass box should be at least W 1100mm x D 1300mm x H 300 mm whereas the outer dimension should be maximum W 1300mm x D 1400mm x H 1900mm. The pass box should be made of S.S 304,at least 1 mm thick sheet with a Mat finish.

2) Front and back door of pass box must be with view panels in suitable size with handles .

3) Interlocking of Doors : The pass box must be electrically operated by ¼ HP, 220 Volt,1400 rpm , 50 Hz motor.

4) The pass box should have Fiber Glass Casing. The blower used for the pass box should be Aluminium Impeller. It must have 1 UV Germicidal Lamp UV-C,75 15 watt with a Hour meter. The pass box will also have a florescent light .

5) The pass box should have one number Magnehelic gauge 0-0 25 mm to air indicate pressure. The power cable for supply will be 1 Sq.mmx 3 Core Flexible cable x 3 mtrs. With 5 A Top

6) The pass box will have 2 box type pleated pre-filter of sizes -at least 600mm x 300mm x 50mm in an aluminium casing, size. Pass box should also have 1 number of HEPA Size : at least 900mm x 600mm x 70mm (Final Supply Filter) mini pleat type 0.3 micron HEPA filter. HEPA should have Aluminium Anodized Casing.

7) Noise Level : The level of noise inside the pass box should be less than 70 dB .

Technical specifications fro the Cage changing station:

1. Inflowing and out-flowing air should be filtered through a particulate pre-filter (G4 efficiency) and then through an HEPA filter, creating a working area with a containment level "ISO 4" according to ISO 14644-1. Every HEPA filter must be tested for integrity or DOP tested. There should be microprocessor-based regulator for air flow speed, with an automatic compensation of the air flow rate.

3. Display should come up with touch screen at eye level with an alpha-numeric display for-
laminar airflow velocity
front air barrier velocity
display of residual lifetime of HEPA filters
display of total time of cabinet operation

4. Acoustic and optical alarm system should be integrated as per performance criteria for microbiological safety cabinets for:

Fault in laminar airflow velocity and front air barrier flow rate,
HEPA filters clogging
Faults in motor blower.

5. Average Laminar Air Flow of >0.30 m/s in the internal chamber (at least 8 measurement points equally distributed in the working area should be validated).The Barrier Air Flow Speed should be ≥ 1300 m3/h.

7. It should have LED illumination with adjustable brightness and two internal 10A power sockets with covers.

8. Working top should be removable, autoclavable and scratch resistant. Minimum working top area should be (L x W x H)1000 x 550 x 600 mm.

9. Protective net or equivalent should supplied to avoid bedding and dust particles clogging the exhaust pre-filter, preserving the lifespan and the efficiency of the HEPA filters. A

removable collection tray to remove and drain all the bedding and food particles accumulated underneath the work surface.

10. Overall dimension should be at least (L x W x H) 1350 x 750 x 1900 mm. Height of the Cage changing station should be electrically adjustable and should allow dual access from two sides, and fitted with angular transparent viewing screen on a hinge to be able to fold for cleaning.

11. The cage changing station should be easily movable around the facility (and through doorways) on its casters