TECHNICAL SPECIFICATIONS

Indoor mechanically ventilated sputum collection booth
1 General

1.1.1 Where reference is made to Contractor, it shall be read to mean the successful bidder appointed to execute the contract.

1.2 Materials and workmanship

1.2.1 All apparatus, components parts, fittings and materials supplied and/or installed whether especially specified herein or not shall conform in respect of quality, manufacture, tests and performance with the requirements of the appropriate current South African (SABS) or British Standard Specifications (BS).

1.2.2 All materials and workmanship which may, in the opinion of TB HIV Care, be inferior to that specified for the work shall be condemned. All condemned material and workmanship must be replaced or rectified as the case may be, to the satisfaction of TB HIV Care.

2 Performance specifications

2.1 Supply Air flow rate

2.1.1 Supply air flow rate shall be at least 2100 m$^3$/h measured as specified herein

2.2 Air exchange rate

2.2.1 The sputum collection booth ventilation rate shall be at least 800 Air Changes per Hour (ACH).

2.3 Booth internal air pressure requirements

2.3.1 The booth shall maintain a negative air pressure with respect to adjacent spaces during operation. No outward airflow is permitted during closed door operation.

2.4 Aerosol filtration requirements

2.4.1 The HEPA filter shall achieve a filtration efficiency of not less than 99.95% when tested as per section 6.4.1 – 6.4.3.

2.5 Noise levels

2.5.1 Noise levels shall not exceed 40 dB 1m away from the booth as per SANS 10103:2008.

2.5.2 Acoustical noise levels shall be compliant with §2.5.1 when tested in accordance with ISO 3743-1 and ISO 3743-2
3 Design specifications

3.1 Booth dimensions

3.1.1 Booth inner dimensions (mm) shall be 1600Lx734Wx1900H.

3.1.2 Booth outer dimensions (mm) shall be 2000Lx740Wx2000H.

3.2 Configuration of aerosol filtration system and fan

3.2.1 Aerosol filtration system (pre and HEPA filters) and fan shall be configured.

3.3 Internal booth surfaces

3.3.1 The internal surfaces of the booth shall be impervious (no gaps or voids), able to withstand regular and vigorous cleaning, washable and easily disinfected.

3.4 Filtration housing

3.4.1 Filtration housing for the Pre and HEPA filter shall be N G™ filter duct housings.

3.5 Plenum

3.5.1 The plenum shall be detachable from the booth.

3.5.2 4 Lockable or retractable wheels shall be provided to the plenum for mobility.

3.6 Inlet air filtration

3.6.1 A G4 air filter matt shall be situated over the fresh-air intake screen.

3.7 Location of supply air grill

3.7.1 The perforated supply air grille shall be located on the ceiling of the booth and shall have an open area of not less than 50% and a hole shape aspect ratio of 1:1.

3.7.2 The grille shall be configured to ensure an even supply airflow distribution throughout the sputum collection booth.

3.7.3 The thickness of the grille shall be at least 0.8 mm.

3.8 High Efficiency Particulate Air (HEPA) filter

3.8.1 An EN 1822 H13 Grade HEPA filter shall be installed as per arrangement shown in the schematic diagram Figure 2.

3.9 Fan

3.9.1 Fan shall be an automatic step less variable speed fan.
3.10 Pre Filter

3.10.1 An F9 filter shall be installed.

3.11 Booth lighting

3.11.1 LED lighting strips shall be installed along the inside gloss white walls above head height.

3.12 Sputum cup holder

3.12.1 The sputum cup holder shall be installed along the inside wall of the booth below the window. The material of the cup holder shall be Perspex or Stainless steel.

3.13 Seat

3.13.1 The seat shall be foldable and able to withstand a dynamic load of 150 kg.

3.14 Window

3.14.1 A window shall be installed for airing purposes.

3.15 Pressure gauges

3.15.1 Pressure gauges with a maximum range of 500 Pa shall be installed across the HEPA filter and the pre filter.

3.16 Automatic door lock system

Automatic door lock system shall be installed.

3.17 Electrical Supply and Safety

3.17.1 The booth power shall be supplied by standard IEC Type M 230V 50Hz single phase power outlet

3.17.2 The fan and fan controller shall comply with the safety requirements of SANS 60335-2-80:2016 “Particular requirements for fans”.

3.17.3 The requirements of SANS 60335-2-65:2015 “Particular requirements for air-cleaning appliances” shall apply

3.17.4 The requirements of SANS 60335-1:2018 “Household and similar electrical appliances – Safety” shall apply
4 Drawings

4.1.1 Drawings are presented for general arrangement purposes.

4.1.2 The contractor shall prepare shop drawings which shall show in detail the construction of all the parts, method of assembly where applicable, materials and connections, sealants, fastenings and all other necessary details.

5 Installation

5.1 Indoor location of booth
5.1.1 The sputum booth shall not be located close to open windows and doors.

5.1.2 The sputum booth shall not align with commonly viewed items such as notice boards, monitors, televisions etc.

5.1.3 Total of 10 sputum booths shall be installed in healthcare facilities located in eThekwini.

5.1.4 The District Manager or Operational Managers of the facilities of sections 5.1.3 shall allocate the exact installation location within the facility.

5.1.5 The contractor shall allow in his tender price for the transportation costs of booths to installation sites.

6 Commissioning

6.1 Testing responsibility

6.1.1 The contractor shall allow in his tender price for the services of appropriately certified commissioning technicians or engineers.

6.2 Airflow direction tests

6.2.1 Airflow direction tests to confirm negative booth pressure shall be conducted as per ISO 14644:3 section B8.

6.3 Booth ventilation rate

6.3.1 Booth ventilation rate shall be tested as per ISO 14644:3 for non-unidirectional airflow system. The test shall be conducted at the exhaust air terminal.

6.4 HEPA Filter integral efficiency test

6.4.1 HEPA Filter integral efficiency test shall be as per ISO 14644:3.

6.4.2 Challenge aerosol particle size shall be as per ISO 14644:3 section B.6.2.2
6.4.3 Challenge aerosol concentration in the booth shall be as per ISO 14644:3 section B.6.2.3.

7 MAINTENANCE AND PERFORMANCE MONITORING

7.1.1 The contractor shall maintain good working order of the sputum collection booth for 2 years after installation.

7.1.2 Fully comprehensive two year maintenance and monitoring plan including all costs shall be provided by the contractor.

7.1.3 The maintenance plan shall include maintenance activities and performance monitoring.

8 GUARANTEE PERIODS

8.1.1 The contractor shall guarantee that spare parts will be available for the expected lifetime of the sputum collection booth and for a period of at least ten years from procurement date.

8.1.2 The guarantee must cover all items against manufacturing defects, installation, commissioning, materials and workmanship. Should manufacturing defects be detected within a 30-day period, the supplier shall replace the equipment with a new one.

8.1.3 Contractors are obliged to refund, repair or replace the failed, unsafe and defective goods.

9 Documentation

9.1.1 The following reports and records shall be provided upon handover:
1) Manual including:
   a) Operating instructions
   b) Maintenance schedule and instructions
   c) Shop drawings
   d) All tests reports
   e) Material data sheets
   f) Equipment data sheets
   g) Decommissioning and disposal plan
10 TRAINING

10.1.1 Training of onsite maintenance personnel and sister in charge by the contractor in the operation, dismantling and cleaning of the sputum collection booth shall be included in the offer.

11 COSTING

The following quotation shall be provided:

For 10 Booths; costs shall include:

- Supply cost per booth
- Delivery and installation cost per booth in the area listed in section 5.1.3.
- Commissioning and validation cost per booth in the area listed in section 5.1.3.
- Maintenance inspections/interventions costs per booth in the area listed in section 5.1.3 per year.