

## Specifications of Autoclave for Biomedical Waste

**Lot-1: 60 Liters (± 10%) for DH and SDH, Lot-3: 40 Liters (± 10%) for CHC & Lot-4: 20 Liters (± 10%) for PHC**

Biomedical Waste Autoclave - High pressure autoclave

Quantities: 9 District Hospital (DH), 2 Sub-District Hospital, 10 CHC, 67 PHC/UPHC

1. Vertical Autoclave - Steam jacketed
2. Equipment should be designed for sterilization of regulated biomedical waste generated from hospital for destruction of bacteria and related organism (Spores).

### Product Eligibility Criteria:

3. Should be CE certified and BIS approved product.
4. Manufacturer should be ISO certified for quality standards.
5. Shall meet General Requirements of Safety for medical devices from a competent authority.
6. Should have valid electrical and functional safety test report from ERTL / BIS or test report provided by Govt.
7. Copy of the certificate/test report shall be produced along with the technical bid
8. Should furnish necessary certificate from testing laboratory

### Chamber Volume:

9. Should have chamber volume of approx. 60 Liters (± 10%) for DH and SDH, 40 Litters (± 10%) for CHC & 20 Litters (± 10%) for PHC
10. Should have a triple walled construction and steam jacketed type. (Operating a vacuum autoclave, medical waste shall be subjected to a minimum of three pre-vacuum pulse to purge the autoclave of all air.)
11. The working chamber, steam jacket, outer chamber and the lid should be made of SS 316 grade.
12. Should have water inlet and outlet valves.
13. Should have a water level gauge.
14. Should have gauges for measuring inner and outer steam pressure.
15. Should have an inner temperature indicator.
16. Should have automatic pressure control switch, safety valve and eject valve.
17. Should have joint-less silicone gasket, with BIS rating
18. Should have automatic low water protection (cut off with audible alarm) and should not use high voltage earthing system.
19. Should have 121°C working temperature at 15 psi pressure per autoclave residence time of not more than 45 minutes or 135°C working temperature at 31 psi pressure per autoclave residence time of not more than 30 minutes. The air removed during the pre-vacuum, cycle should be decontaminated by means of HEPA and activated carbon filtration, steam treatment, or any other method to prevent release of pathogen
20. Chamber volume for 60 Liters should be approximately 375mm diameter and 550mm depth. For 40 Liters should be approximately 325mm diameter and 500mm depth. For 20 Liters should be approximately 275mm diameter and 350mm depth
21. Should have foot operated lid opening with radial locking lid.
22. Should have vacuum system with minimum vacuum of 6 inches mercury ( - 0.2 kg/ cm<sup>2</sup>)
23. Should supply minimum 2 nos of bins of compatible & suitable size for autoclave.
24. Water inlet and outlet pipe should be provided and connections should be done.

25. The piping and the fittings are of stainless steel and brass.
26. Epoxy powder coated compatible stand to place Autoclave

**Spore testing:** The autoclave should completely and consistently kill the approved biological indicator at the maximum design capacity of each autoclave unit. Biological indicator for autoclave shall be *Geobacillusstearothermophilus* spores using vials or spore Strips; with at least 1X10<sup>6</sup> spores.

27. The pressure test certificate should be submitted with the bid.

**Stabilizer:** Bidder shall provide appropriate stabilizer. Warranty: 3 years.

**The equipment (Autoclaves) should have following features:**

28. Heating Element, should be BIS rating
29. Pressure Gauge
30. Digital Temperature & Pressure Indicator
31. Temperature recorder with printing facility
32. Steam release valve
33. Door lock
34. Safety valve
35. User control
36. Timer Alarm
37. Water Level Indicator
38. Biohazard symbol
39. Warranty: 3 years on-site comprehensive warranty
40. Documentation: 1. User's Manual, 2. Log-Book Epoxy powder coated compatible stand to place Autoclave
41. Accessories required: Heating Element- 05 Nos, should be BIS rating
42. Spare Parts & Consumables- use only genuine OEM-approved spare parts
43. **Power requirement:** Power Input voltage- 220V AC, 50Hz, single-phase fitted with Indian plug of appropriate rating.

## **Lot-2: Technical Specification of Biomedical Waste Shredder (25Kg / hr)- For DH/SDH**

### **General**

#### **1. Use**

1.1	<b>Overview of Functional Requirement</b>	A closed system shredder designed for shredding of recyclable plastic hospital where the final treated waste should be non- reusable & non recognizable and should be reduced to 70 to 80% of the volume.
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### **Standards and Safety**

#### **2. Quality Standard relating to**

2.1	<b>Product</b>	a) Product should be CE or BIS approved product. b) Cutter motor should be ISI marked. c) Should be CPCB approved with compliance under Gazette Notification 1998 and revisions there upon.
2.2	<b>Manufacturer</b>	Should be ISO 9001 certified for quality standards.
2.3	<b>Electrical Safety</b>	Should conform to the standards for electrical safety as per BIS.
2.4	<b>Test certificates</b>	Test certificates from Govt. approved laboratory or NABL approved laboratory for Steel grade certificate should be furnished in the technical bid.

### **Technical**

#### **3. Technical requirements, desirable characteristics:**

3.1	<b>Operational requirement</b>	<ol style="list-style-type: none"><li>1. Should be of robust design with minimum maintenance requirement.</li><li>2. Should be properly designed and covered to avoid spillage and dust generation. It should be designed such that it has minimum manual handling.</li><li>3. The hopper and cutting chamber of the shredder should be so designed to accommodate the waste bag full of biomedical waste.</li><li>4. The shredder blade should be highly resistant and should be able to handle/ shred wet waste, especially after microwave/ autoclave/ hydroclave.</li><li>5. The motor should be connected to the shredder shaft through a gear mechanism, to ensure low rpm and safety for better gripping and cutting of the biomedical waste.</li><li>6. Should have induction motor and the minimum capacity of the motor attached with the shredder should be adequate enough for carrying out for 25 Kg/hr. This would ensure efficient cutting of the bio-medical waste as prescribed in the bio- medical waste (Management &amp; handling) Rules.</li><li>7. Should be provided with sliding System to avoid spreading of waste during removal of collection trolley.</li></ol>
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3.2	<b>Technical characteristics:</b>	<p><b>a) Capacity of Shredder: 25 Kg/Hr</b></p> <p><b>b) Type:</b> Low Speed / Low RPM (preferably 30 to 40 rpm)</p> <p><b>c) Material of Construction of Outer Body:</b> Mild Steel (M.S), 5 mm Thickness</p> <p><b>d) Material of Construction of Cutter :</b> Non-Corrosive &amp; hardened Alloy Steel</p> <p><b>e) Waste Feeding Platform:</b> MS Structure having minimum <b>3 feet height</b> from discharge point to ground level.</p> <p><b>f) Waste Feeding System :</b> Manual Through Hopper</p> <p><b>g) Electric Load:</b> 3 KW or less with at least 4HP induction motor</p> <p><b>h) Shaft :</b> Double Shaft</p> <p><b>i) Drive :</b> Belt or Gear Drive</p>
3.7	<b>Control Panel</b>	<p>a) Should be Pre-Wired and Powder Coated.</p> <p>b) Should be provided with auto stop/reversing, Emergency stop &amp; Limit Switch with audio and/or visual alarm or indicator for the stoppage.</p>
<b>4. Safety Features to operate this type of device</b>		
4.1	<b>Operational Safeties</b>	<p>a) Interlocking with Limit Switch</p> <p>b) Shock proof &amp; insulated as per safety norms.</p> <p>c) Protection against scattering of shredded waste</p>
4.2	<b>Safeties for Overloading</b>	<p>a) Reverse Motion to avoid overloading or jamming mechanism</p> <p>b) Motor overload protection.</p>
4.3	<b>Automatic emergency stop</b>	<p>a) Limit switch should be provided to switch off the Shredder if hopper lid or door of collection box is opened, so that shredder should stop automatically for safety of operator.</p> <p>b) In case of shock-loading (non-shred able material in the hopper), there should be a mechanism to automatically stop the shredder to avoid any emergency/ accident.</p>
4.4	<b>General Safety</b>	<p>a) The unit should be suitably designed for operator safety, mechanical as well as electrical.</p> <p>b) Anti-vibration mounting should be provided.</p>
<b>5. Physical Characteristics</b>		
5.1	<b>Noise (in dBA) &amp; Vibration</b>	Low Noise (below 60 dB) and No Vibration
5.2	<b>Heat dissipation</b>	Should maintain nominal Temp & heat should be disbursed by a cooling mechanism.
5.3	<b>Mobility, portability</b>	Stationary Installation Type
<b>6. Energy Source (electricity, UPS, solar, gas, water etc.)</b>		
6.1	<b>Power requirement</b>	Power Input voltage- 220V AC, 50Hz, single-phase fitted with Indian plug of appropriate rating.

6.2	<b>Protection</b>	a) Resettable overcurrent breaker, RCB, MCB, Dipole switch, fuse b) Voltage corrector as applicable for the product for protection against surge current & voltage fluctuations. c) Should have over-charging cut-off with visual symbol.
6.3	<b>Warranty</b>	3 years on-site comprehensive warranty including Routine preventive maintenance, Breakdown and emergency repairs, Spare parts replacement (Spare Parts & Consumables- use only genuine OEM-approved spare parts), Calibration and validation, Technical support and troubleshooting etc. Maximum time to attend any Repair call is from 24 to 72 hours. Please include an escalation matrix.