

Autoclave powered by solid fuel

Country of origin | United States of America

Health problem addressed

Surgical Site Infections (SSIs) are the most common type of infection experienced by patients. In rural settings, electric autoclaves help prevent these infections, but are expensive or impractical for hospitals to buy, maintain and use. This autoclave ensemble addresses the needs of patients and practitioners for clean medical supplies in off-the-grid health centres or emergency locations. The ensemble can also be used for the sterilization of medical waste for a cleaner environment.

Product description

The stove is fitted with an adapter ring that allows the autoclave to be powered by this super-efficient, institutional-sized, biomass-burning stove. The autoclave sits within the stove-body receiving heat simultaneously from both below and 360 degrees around the sides the unit by a biomass fire in the combustion chamber below. Super-efficient combustion of biomass produces a minute amount of smoke. Further, any smoke produced is expelled through an attached chimney that can be configured for both indoor and outdoor use. The stove remains safe to touch at full temp. As little as 1 kg of wood is enough to power the stove ensemble for a cycle. Ensemble is easily transportable.

Developer's claims of products benefits

Most existing autoclaves use electricity, making them expensive for off-the-grid health centers that must use a generator to run them. Furthermore, most waste is burned or unhygienically disposed-off. This system harnesses the most fuel-efficient, institutional rocket stove on earth and uses one tenth the fuel to complete a sterilization cycle in under an hour. It is faster, safer, more efficient, and more environmentally-sound than alternative technologies for sterilizing equipment or waste.

Suitability for low-resource settings

This autoclave uses solid fuel as an energy source (e.g. wood, briquette, other biomass) and is appropriate as a primary autoclave system for rural healthcare centers (hospitals, clinics), or as a backup system for urban centers. Its fuel-flexibility, efficiency, ease of use, dependability, minimal environmental impact and minimal operating costs make it appropriate for any low-resource situation.

Operating steps

Insert adaptor ring on stove, prepare and load autoclave for sterilization cycle. Start fire in combustion chamber. Insert sterilizer, bring to pressure, following venting protocol. Time sterilization cycle. Remove sterilizer from stove. Vent remaining steam from unit.

Regulatory status

FDA Registered (Food and Drug Administration)
And ISO 13485 (Medical Device)

Future work and challenges

The biggest challenge is overcoming mind-sets: that burning is an appropriate waste-management practice, that electrical technology is the best in developing world settings, and that environmental health should be a consideration of any health centre.

Use and maintenance

User: Any trained personnel

Training: Training is possible either by watching a video or by reading the instruction manual and following directions

Maintenance: Combustion chamber cleaned of ash after each use

Environment of use

Setting: To be used in rural or urban settings, either indoor or outdoor at any level of healthcare facility

Facility Requirements: Clean water supply and access to solid fuel

Product specifications

Weight (kg): 56 kg

Dimensions: 880mm x 610mm x 980mm

Consumables: biomass fuel (firewood, coal, pellets, etc.)

Lifetime: 10 years

Retail price (USD): 1600

Price of consumables (USD): variable

Other features: mobile

Year of commercialization: 2011

Currently sold in: Worldwide



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