Sterilizing units, steam, tabletop

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**Health problem addressed**

A steam sterilizer is an integral component in a medical environment requiring sterile products for patient care. Typical items to be sterilized include surgical instrument packs, implants, irrigation fluids, and obstetric and dental instruments.

**Product description**

Steam sterilizers use pressurized steam to generate moist heat to eliminate viable microbes from non-heat-sensitive medical devices used for surgical and general patient care. Steam sterilizers consist of a stainless steel sterilizing chamber (rounded or rectangular) outfitted with a data recorder and/or microprocessor. The unit may house a steam generator, removable racks, and/or water saver system. In a gravity sterilizer, air is exhausted through a steam trap at the bottom of the chamber. Vacuum sterilizers eliminate air by applying a partial vacuum and therefore require a vacuum pump. Tabletop steam sterilizers require minimal installation and are used in a wide variety of medical and laboratory environments.

**Principles of operation**

Steam enters the sterilizer chamber and contacts the outer layer of the wrapped fabric packs, condensing on the surface and transferring heat to the fabric. The steam then condenses on the next layer inward; the process continues until the steam has heated all items within the packs. Once the steam has penetrated the packs and heated their contents to the selected temperature (typical temperature range is 121° to 135°C), the packs are held at that temperature for a preset length of time. After the sterilization cycle is complete, the steam is exhausted and the sterile items are dried using radiant heat from the chamber and the evaporative effect of the vacuum methods.

**Operating steps**

- Items to be sterilized are cleaned to remove contaminants and rinsed with distilled or demineralized water to remove any detergent or tap-water residues.
- Items are put into packs and loaded into baskets that are placed in the chamber.
- The chamber is closed and the appropriate time and temperature settings are selected for the material being sterilized.
- When the cycle has completed, the sterile items are removed and carefully stored.

**Reported problems**

False-positive biological indicators can occur even though the sterilizer is functioning properly. A common problem with vacuum steam sterilizers is inadequate air removal from the sterilization chamber, which can usually be traced to a worn door gasket or to problems with the vacuum system. The mechanical safety of steam sterilizers is a concern because the chamber is under significant positive or negative pressure at different times during the cycle. Worn parts can affect the mechanical integrity of the chamber door and defective circuit boards can cause smoke and fires within affected units.

**Use and maintenance**

User(s): Sterile processing (supply) technicians, laboratory technicians, medical office technicians

Maintenance: Biomedical engineer/technician, medical staff, manufacturer/servicer

Training: Initial training by manufacturer, operator’s manuals, user’s guide

**Environment of use**

Settings of use: Hospital central sterile processing (supply) department, hospital (surgery suite, labor and delivery areas), physician office, dental office, outpatient facility

Requirements: Line power, steam source, dedicated circuit recommended for some models

**Product specifications**

Approx. dimensions (mm): 450 x 500 x 500; covers all types and variations
Approx. weight (kg): 40-60; covers all types and variations

Consumables: Fabric packs (wrappers) are needed to wrap items to be sterilized

Price range (USD): 1,500-10,000 (4,000 typical); price covers all types and variations

Typical product life time: 10 years

Shelf life (consumables): NA

**Types and variations**

Can be categorized by method of air removal:
- Gravity
- Vacuum
- Steam flush-pressure pulse

Units can use a combination of methods. Most characteristics are similar across variations.