

GEW162-14

702.18, 702.18.1

Proponent: John Williams, CBO, Chair, representing ICC Adhoc Health Care Committee
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Delete without substitution:

~~**702.18 Autoclaves and sterilizers.** Autoclaves and sterilizers requiring condensate tempering systems shall be of the type that does not require potable water to be blended with the discharge water to reduce the temperature of discharge.~~

~~**702.18.1 Vacuum autoclaves and sterilizers.** Vacuum sterilizers shall be prohibited from utilizing venturi-type vacuum mechanisms using water.~~

Reason: There are problems with the code text requirements and the types of sterilizers currently on the market. In Section 702.18.1, there is only one manufacturer that provides this type of device.
For Section 702.18

Options with Pros and Cons

Chilled Water Recirculation Loop for Medium & Large Size Sterilizers – Reduces total water consumption per sterilization cycle to 1-1.5 gallons.

Pros:

- Sterilizers are tied into the facility's chilled water recirculation loop when systems have excess capacity to supply and cool steam sterilizer units. This recirculation loop prevents the majority of the water used in the steam sterilizers to be flushed down the facility drain
- Only 1-1.5 gallons of water are consumed per cycle

Cons

- Added product acquisition costs (\$ 5,000 to \$ 10,000) per sterilizer + any associated installation costs to connect to the facility chilled water system
- Added cost for hospital to install Chilled Water Loop piping infrastructure to the SPD department. Might require larger chiller system to feed multiple steam sterilizers in SPD. (additional cost)
- Some competitors require additional sq/ft to install chilled water recirculation system (lost space to the facility)
- This option may not be viable to facilities that are replacing old sterilizers with new ones. (infrastructure, footprint, cost, etc.)
- Currently not available on small sterilizers (3-5 year development project). Vendor cost would increase
- Many hospitals do not have excess chilled water capacity for the SPD
- Chilled water supply all year round, for all seasons in the northern US might not be feasible.
- Some facilities don't rely on a central steam boiler system for the steam sterilizers. These Customers use electric steam generators to supply their steam sterilizers. Stand alone or integral steam generators must have potable water for steam generation, discharge of sterilizer, and discharge of generator. There is no manufacturing chilled water solution for stand alone or integral steam generators. No current solution

Non Potable Water Options (Grey Water or Rain Water)

Pros

- Utilize untreated water and save potable water consumption

Cons

- Today, manufactures have designed steam sterilizers to accept only one feed water source, potable water. To change this design to accept grey water & potable water for the steam sterilizer, there would be an increase the total acquisition cost of the sterilizer unit.
- Steam sterilizers have specific water quality requirements to ensure proper performance. There are no current water quality standards established for the use of grey water in steam sterilizer systems. Facilities will still need to meet manufacturing water quality requirements even with grey water. Obviously there is more variability and unknown elements in grey water that exponentially increase water quality variability. New project development required (3-5 years) by manufacturers. Added cost of equipment (\$ 1,000 - \$ 2,000) per unit depending sterilizer model.

- Grey Water must be collected and treated by hospital. Cost to the facility to implement Non-Potable Water could be significant. (reclamation, collection, treatment, filtration, and delivery to the SPD)
- Hospital infection control concerns with Non-Potable Water in clean (sterile processing) environments, creation of aerosols, potential bacteria introduced from these systems, cross contamination, backflow issues, etc. are all concerns.

Alternate Non-Potable Water Reclamation/Recirculation Systems

Pros

- Utilize water loops for discharge to recirculate and only add fresh water when needed. System could be consolidated for several units (mini water treatment system in each facility) or stand alone for each sterilizer.

Cons

- Effectively requires a mini water treatment unit inside each facility. Additional cost and maintenance would be the responsibility of the facility. (water must be decontaminated & treated)
- Nothing commercially available at this time from any of the major sterilization equipment manufacturer.
- Multiple systems would be required for multiple sized units or entire departments, adds significant cost and requires additional space for processing water recirculation by hospital.
- Hospital infection control concerns with Non-Potable Water in clean (sterile processing) environments, creation of aerosols, potential bacteria introduced from these systems, cross contamination, backflow issues, etc. are all concerns.

Steam Condensate Return Lines

Pros

- Steam condensate is returned to the boiler, which is the largest reason for water consumption in a sterilizer cycle. Water consumption significantly reduced.
- Know technology, but not available for steam sterilizers

Cons

- Additional cost for return piping infrastructure by hospital
- Hospital infection control concerns to return steam that was used for sterilization purposes into the main hospital steam boiler system
- Potable water still needed for 50% of the units sold with a built in steam generator
- No current commercialized solution available on the market for steam sterilizers

SUMMARY

All of these options will require additional equipment, cost, square footage, and infrastructure changes by the facility. Many of these options may not be available in facilities such as small hospitals, surgery centers, or converted/renovated hospital space. Additional product development, FDA Submission, or additional equipment from manufacturers could take 3-5 years to comply with these codes.

For Section 702.18.1:

Select small & medium sized steam sterilizers currently use Venturi-type vacuum mechanisms. Venturi systems do have a positive role for certain applications. Small steam sterilizers are infrequently used near the OR. These small sterilizers have low usage and lower water consumption vs. larger units. Venturi systems cost much less than vacuum pump systems. If vacuum pumps are the only solution, small steam sterilizer costs will increase. The footprint of the sterilizer might also increase, making it difficult to replace older units that were smaller in design.

We agree that medium to large steam sterilizers should only use vacuum pump systems due to their larger water volume demand per cycle.

Pros

- Vacuum Pump Systems (vs. Venturi systems) could reduce water consumption by 40-50%

Cons

- Vacuum systems are not available currently for the small sterilizers from largest market share manufacturer in US at this time. To our knowledge, only one manufacturer uses vacuum pumps in small sterilizers which would create a monopoly with new code language
- Hospitals would be required to run additional electric (208 or 480 service) to ALL locations requiring small sterilizers. Currently only 50% of the small sterilizers sold require the installation of the high voltage, 3 phases lines. Additional costs would be incurred to provide electrical lines or force hospital to purchase larger sterilizers with built in vacuum pump.
- Vacuum pumps use additional electric consumption as a trade off for the water saving.

- Vacuum pumps still require water for the seal. Facilities would still have to incur the costs of providing water lines to the units.

Pump noise levels may not be acceptable in clinical spaces adjacent to operating rooms

Small sterilizers with electric steam generators, water recirculation, and vacuum pumps may expand the footprint of the sterilizers beyond what is acceptable in small areas provided in the OR space, requiring additional sq/ft costs by the facility

Not commercially available (3-5 year development process)

Added cost could be 10-15% above current costs (Average unit costs \$35-45k for surgery applications today)

This proposal is submitted by the ICC Ad Hoc Committee for Healthcare (AHC). The AHC was established by the ICC Board of Directors to evaluate and assess contemporary code issues relating to hospitals and ambulatory healthcare facilities. The AHC is composed of building code officials, fire code officials, hospital facility engineers, and state healthcare enforcement representatives. The goals of the committee are to ensure that the ICC family of codes appropriately addresses the fire and life safety concerns of a highly specialized and rapidly evolving healthcare delivery system. This process is part of a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. Since its inception in April, 2011, the AHC has held 11 open meetings and over 162 workgroup calls which included members of the AHC as well as any interested party to discuss and debate the proposed changes. All meeting materials and reports are posted on the AHC website at: <http://www.iccsafe.org/cs/AHC/Pages/default.aspx>

Chilled Water Recirculation Loop for Medium & Large Size Sterilizers – Reduces total water consumption per sterilization cycle to 1-1.5 gallons.

Cost Impact: Will not increase the cost of construction.

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