

Storm King®

Sedimentation, Floatables Capture, and Disinfection in One Device

Product Summary

Primary treatment equivalency, floatables control, & in-vessel disinfection.

The Storm King® is an advanced hydrodynamic vortex separator that utilizes proven technology providing a combination of grit removal, primary treatment equivalency (TSS and BOD reduction), floatables control and in-vessel disinfection within a single unit process. The system is ideal for satellite or centralized treatment at overflow sites because it is self-activating, has no moving parts and requires no power to separate solids.

How it Works

Flow is introduced tangentially into the side of the Storm King® barrel (red arrow) causing the contents to rotate slowly about the vertical axis. The flow spirals down the perimeter allowing solids to settle out by gravity. This process is aided by rotary forces, shear forces and drag forces at the boundary layer on the wall and base of the vessel.

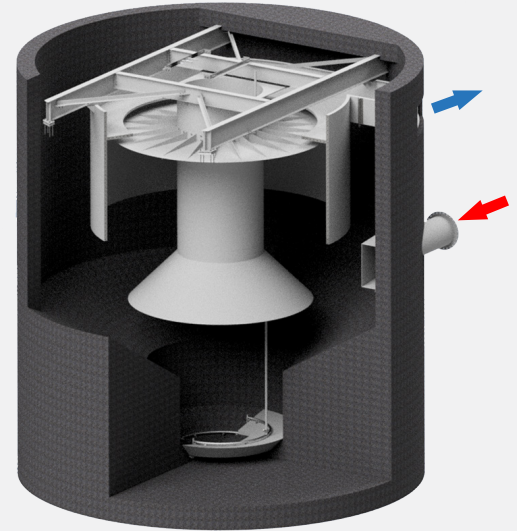
The internal components direct the main flow away from the perimeter and back up the middle of the vessel as a broad spiraling column, rotating at a slower velocity than the outer downward flow. A dip plate locates the shear zone, the interface between the outer downward circulation and the inner upward circulation, where a marked difference in velocity encourages further solids separation. Settled solids are directed to the collection chamber located under the center cone and are conveyed out by gravity or through a recessed impeller pump. Treated effluent is discharged into a receiving watercourse, a storage facility, or continues on to receive further treatment. (blue arrow).

The collected solids accumulate in the base of the unit and are returned to the sanitary flow (pumped or gravity flow) to continue on to the wastewater treatment facility.

Bacteria reduction is achieved within the Storm King® by introducing chemicals such as Sodium Hypochlorite, Peracetic Acid, or Chlorine Dioxide into the upstream diversion structure or into the inlet pipe of the vessel. The spiraling action integral to the system combined with the predictable flow path of the separator allows the unit to combine its solids and grit removal duties with disinfection.

Dechlorination (if applicable) is performed at the discharge of the unit (by others).

Storm King® Flow Pattern



Applications

- » Floatables capture, primary treatment equivalency and disinfection of combined sewer overflows (CSOs) and wet weather induced flows
- » Remote or unmanned treatment facilities
- » Treatment of excess wet weather flows at centralized facilities or POTWs, either through direct discharge through a CSO outfall or blending of the Storm King effluent at the plant discharge.
- » Retrofit or new wet weather treatment facilities
- » Preliminary treatment prior to storage or equalization

Benefits

- » No power and no moving parts
- » Self-activating with a small footprint
- » Fine grit removal, primary treatment equivalency, in-vessel disinfection, and additional storage
- » Combines four unit processes in a single device
- » Captured material returned to sanitary flow thereby eliminating the need for residuals handling capabilities at remote sites

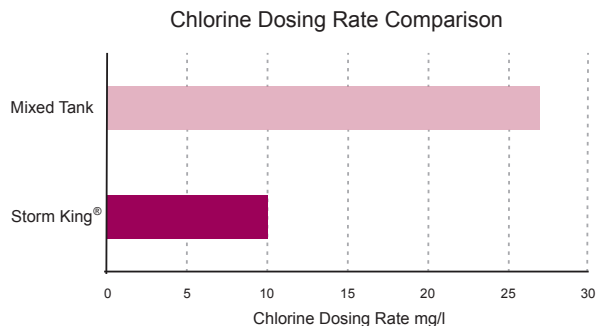


Performance

- » 30 to 50% TSS and up to 30% BOD reduction for primary treatment equivalency
 - Additional removal capable with chemical addition
- » Floatable Reduction
- » Proven high rate disinfection in less than 8 minutes

Space Efficient Treatment

The Storm King® has a long history of providing protection to watercourses. One of the benefits of the Storm King® can provide is solids removal and disinfection in the same vessel. Taking advantage of the separator's complex flow paths created by the unique internal components, the Storm King® can provide excellent efficiencies, potentially using a fraction of the disinfection agent while occupying less than 30% of the area required for conventional disinfection solutions. The Storm King® is able to achieve 3 to 4 log kills of total or fecal coliform bacteria within an 8 minute hydraulic retention time and handle commonly available disinfectants such as Sodium Hypochlorite, Peracetic Acid, or Chlorine Dioxide.



Maintenance

The Storm King® has no moving parts and typically requires no higher maintenance commitment than the sewer system in which it is placed.

The maintenance requirement is dependent upon the influent characteristics, which in turn are dependent upon the nature of the contributing system.

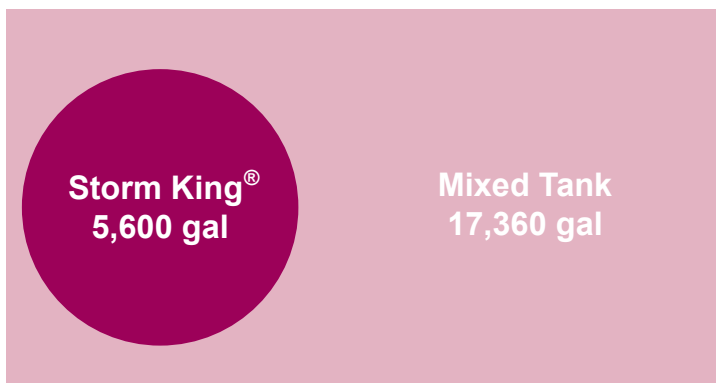
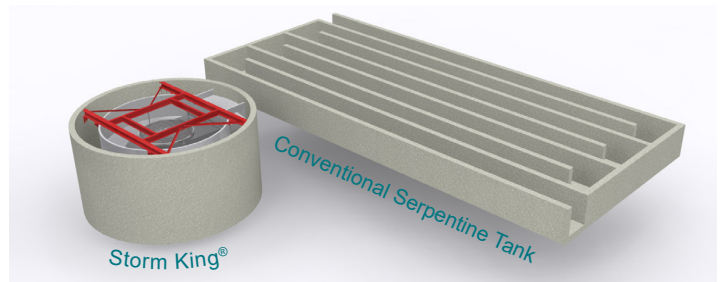
Once the device has been brought on-line, the Storm King® should be visually inspected after the first two spill events. After the initial inspections, visual inspection of the equipment should be carried out twice per year, or as deemed appropriate for the location.



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Capacity

- » Sized for peak flow at peak grit loads
- » Virtually no turndown ratio limits
- » Modular and expandable combinations to fit any size plant



Comparisons of Disinfection Area Required for Storm King® and Conventional Disinfection Tanks



Learn more

Visit our website to learn how the Storm King® can help improve your water quality.

→ hydro-int.com/StormKing