Overcoming The High-Maintenance Headache Of Septage Receiving

Source: Duperon

In rural communities without direct sewer collection networks, septage receiving stations serve as the critical gateway between haulers and the local treatment plant. Yet, for many plant operators, septage receiving is a challenging, labor-intensive process. Tanker trucks arrive with highly unpredictable loads. They can include heavy concentrations of fats, oils, and grease (FOG), thick grit, large rags, and debris ranging from blue jeans to chunks of concrete.



Photo courtesy Duperon

Traditional receiving equipment struggles to handle these dense and difficult mixtures. Traditional septage systems typically use a mechanical means that can struggle with variable sludgy and FOG debris due to incomplete cleaning or blinding of the screened media. In addition, rags and clothing frequently wrap around internal augers and shafts, forcing operators to manually cut and remove them. While traditional septage receiving systems use inline rock traps to prevent stones and pieces of concrete from damaging downstream machinery, these systems require frequent manual cleanouts. To eliminate these persistent operational headaches, Duperon developed the SmartWave™ Septage Receiving Screen (Figure 1). This compact solution was built around controlled vibration technology to accelerate receiving capacity and reduce operator intervention.

Controlled Vibration For Liquid-Solid Separation

Rather than relying on mechanical scrapers, brushes, or rotating drums, the SmartWave utilizes continuous controlled vibratory motion to convey and separate solids. To generate this motion, the primary machine basket floats on isolation dampeners while dual centrifugal electric motors create a precise continuous vibration. The vibration conveys the debris across the screening panels and out through the discharge chute.

This process redefines how heavy solids and sticky materials behave:

- **Reduced blinding and smearing.** Preliminary testing indicates that eliminating mechanical wipers and scrapers helps prevent grease and FOG from being smeared across the screen surface, reducing blinding and improving performance.
- **Easier rag and clothing handling.** Stringy materials and heavy rags convey forward continuously on the filtered media, preventing the debris from rag-tailing or binding.

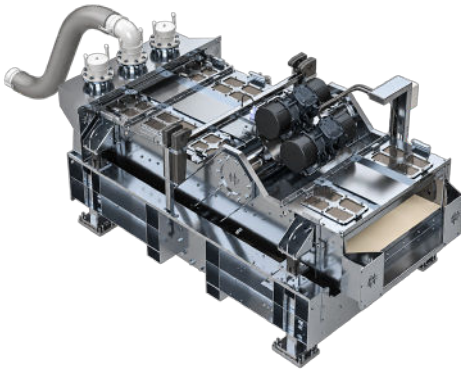


Photo courtesy of Duperon

Figure 1. The SmartWave was designed to relieve common challenges in septage receiving, including those caused by rags, FOG, rocks, and more.

- **Integrated rock handling.** Rocks and gravel are conveyed across the screen panels and discharged with the other screened debris, eliminating the need for a separate collection chamber and manual cleanout.

To help protect the media from impact damage when heavy materials arrive, influent flows into a patent-pending dynamic head box. This head box absorbs most of the initial impact of incoming loads, slows the fluid velocity, and distributes the liquid evenly across the screening panels.

High-Performance, Compact Footprint

While traditional septage screens often feature openings ranging from 6 mm up to 13 mm, the SmartWave utilizes perforated panels with 5 mm (roughly 3/16") openings. This smaller aperture captures significantly greater amounts of fine debris, grit, and small stones before they reach downstream processes.

Despite offering finer screening, the unit delivers a higher flow capacity than most receiving systems, processing between 1,200 and 1,600 gallons per minute (GPM). This high throughput allows receiving stations to offload tanker trucks in a fraction of the time. Testing shows offload cycles of just 5 to 10 minutes, rather than traditional 20 to 30 minutes. In high-volume facilities, the unit can even be configured to accept flow from two trucks simultaneously.

This high throughput is delivered in a compact physical footprint measuring approximately 6' wide by 11.5' long and 6.5' high. The unit is entirely self-contained and includes built-in forklift pockets, lifting lugs, and site-specific discharge orientations. This allows facilities to drop the unit directly onto a pad or over an existing channel without extensive civil engineering modifications.

Minimizing Maintenance And Structural Fatigue

With no rotating shafts, submerged bearings, scrapers, and dynamic seals, the SmartWave has significantly fewer lifecycle maintenance demands. The primary wearable components are isolated to the motors, dampeners, and screen panels. The screens themselves are made of high-tech wear-resistant plastic. To change the screens –– either to swap out for different opening sizes or to replace them –– the system has quick-change wedge blocks that allow operators to easily remove and reinstall panel sets.

Because vibration is central to SmartWave's strategic advantage, the unit also incorporates isolation pads and integrated dampeners. These isolation components absorb the kinetic energy generated by the counterweight motors, preventing dynamic vibration from transferring into surrounding concrete pads oradjacent facility structures. Operationally, the unit generates minimal noise and is quieter than septage trucks.

Equipped with optional washdown manifolds and optional exhaust ports for odor scrubbing, the SmartWave provides a simplified hands-off approach to septage handling. By substituting continuous vibratory motion for heavy mechanical scrapers, wastewater facilities can protect downstream processes, increase daily truck throughput, and free operators from constant manual intervention. ■