

Technical Article Series

Meat packer recovers valuable solids from wastewater.

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Effectively recovers valuable solids from wastewater

SANITATION & MAINTENANCE 11

Anthony Scafaldi, Plant Engineer, Penn Packing Co. with Food Staff

Vibrating screen separator helps plant meet EPA requirements and reduce sewerage surcharge

NEW SOLUTIONS OF PLANT PROBLEMS

PROBLEM:

Penn Packing Co. slaughters about 6000 hogs per day and processes them into fresh pork and several by-products in its Philadelphia, Pa., plant. Wastewater from these operations, amounting to 300- 500 GPM, contains a variety of solids, including pouch and intestine contents, some blood, fat, meat tissue, hair, etc. Separating this material from the liquid had been a problem for many years.

At one time the waste material was collected in a tank. Solids were partially removed by a man with a long-handled screen. Much of the valuable grease, fat, and some solids were lost. This was a hard job, and frequent floor clean-up was required. Later, a tank equipped with a drag chain was used to collect the solids. The wood flights on the drag chain broke easily, and the operation was not efficient.

SOLUTION:

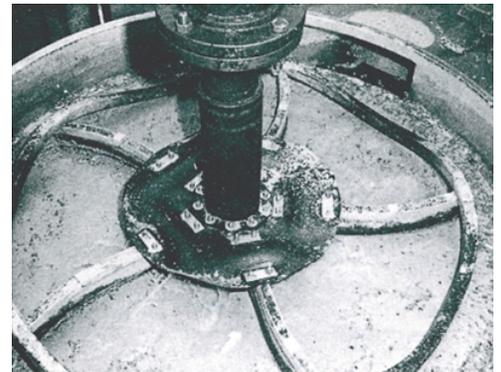
The three-dimensional, inertial vibratory motion imparted by upper and lower eccentric weights is the basic principle of the separator. The top eccentric weight, operating in a plane close to the center of the assembly mass, generates a horizontal throw. The bottom eccentric weight, rotating below the center of the assembly mass, produces a high-frequency tilt on the screen. A tangential component, resulting from the combined horizontal/vertical movements, moves the retained solids across the screen to the solids outlet, while facilitating the flow of liquid waste through the screen.

Both top and bottom eccentric weights are independently adjustable for mass and angular relationship. Consequently, the tangential motion is also variable. Adjustments can be made in a few minutes for maximum screening efficiency.

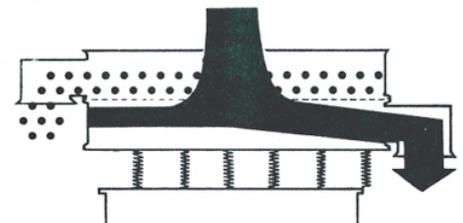
Since the screen assembly is isolated from the base by stainless steel support springs attached to rubber mounts, vibration is not transmitted to the floor. This makes it possible to mount the separator on a light platform, standard plant floor, or on a portable base.

The clarified effluent from the separator contains small amounts of extremely fine proteinaceous material and fat (grease) which is fed to a dispersed air flotation unit. Here flocculating chemicals are added to assist the grease to float to the surface where it is skimmed off for further processing into low grade tallow; clear effluent and fine proteinaceous material is further rendered.

The continuous, efficient operation of the separator is critical to the successful operation of the entire waste treatment system. A malfunction of the separator would permit heavy solids to enter the dispersed air



Plastic rings prevent underside blinding by shearing action that cuts fibers and scrapes away gummy material.



Arrows show flow pattern of separated liquid passing through screen. Three-Dimensional vibrations speed passage of liquid waste through screen, while accelerating movement of solids across screen. Note support screens below the screen.

flotation unit. These solids, failing to float on the dispersed air bubbles, would accumulate and putrefy on the bottom of the flotation tank.

To assure continuous reliability, and prevent blinding of the screen due to passage of fat-bearing fibrous materials, especially during cold weather, the separator was equipped with two anti-blinding devices. Blinding of the screen's top side is prevented by a Neoprene blade assembly that rotates continuously on the upper surface, wiping it clean. Blinding of the underside is prevented by plastic rings that rotate beneath the operating screen. (See drawings.) Both anti-blinding devices are self-actuated by the three-dimensional vibrating movement of the separator.

In addition to solids/liquid separation for dewatering or concentration of solids and clarification of liquids, these separators can be used for the division of different dry materials on the basis of particle size; precise division of a dry material into sized fractions; and solids classification in a liquid medium, sometimes called wet classification.

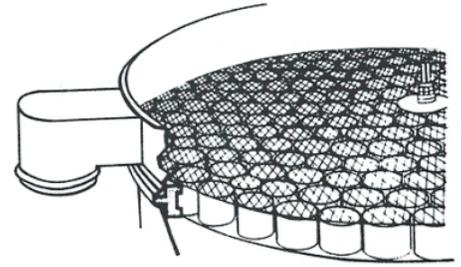
RESULTS:

The separator at Penn Packing is paying for itself by the recovery of useful solids. Six drums are recovered per day which go to the inedible rendering department.

It eliminated hand skimming, which was a tiresome job that required constant mop-up and cleaning.

Maintenance is simply a matter of rinsing the screen twice a day with hot water.

Penn Packing Co. feels the separator is necessary in a slaughtering and meat packing waste treatment system to meet EPA wastewater standards and to reduce or eliminate a sewage surcharge.



Rotation of Neoprene blades minimized blinding of topside screen surface. Action sheers and scrubs viscous and fibrous stringy material.