

**Paddle Dryer turns waste into income for food processing plant.**

A northeast food processor turns its activated biological sludge waste from its manufacturing process into income by recycling the waste as an ingredient for organic fertilizer.

When the state banned landfilling of the biological waste, a study was conducted that showed the waste contained enough nutrients to be considered a fertilizer ingredient.

The company discovered the best way to produce this fertilizer ingredient was to indirectly dry the sludge to a granular state. First, a Komline-Sanderson Kompress® Belt Filter Press partially dewateres the sludge to 11.5% solids. Then a steam heated K-S/Nara Model 8WL Paddle Dryer dries the belt filter press sludge cake to a granular 90% solids.

Waste water from the processing plant is aerated and clarified. Thickened sludge from the clarifier is conditioned using polymers prior to dewatering on a 2-meter wide Komline-Sanderson Kompress® Belt Filter Press Model G-GRS (Photo 1 background).

The partially dewatered sludge enters the paddle dryer (Photo 3, background/Photo 2, left) through a choke screw conveyor at a rate of 2800 pounds per hour. The choke screw is used to minimize air infiltration.

The paddle dryer consists of an omega-shaped trough with two agitators. Hollow, heated, wedge-shaped blades are mounted on the agitator's hollow shafts. This configuration

provides a very high ratio of heat transfer surface area to process volume. The heat transfer surface area in this particular application is 553.1 square feet.

The wedge shape of the blades adds to the unit's effectiveness. The relative movement of the particles in the process mass, combined with the action of the rotating agitator, causes a washing or shearing action on any film that might tend to form on the heat transfer surface. The two intertwined agitators ensure that the sludge is mixed thoroughly while being transported through the dryer quickly. The dual shafts acting like a pug mill produce greater kneading and tearing action than a single shaft style dryer, breaking up the mass more efficiently.

In the paddle processor, 3400 pounds per hour of steam at 100 psig pressure and 338°F is used to dry the sludge. The steam is generated by a steam boiler (Photo 1, left). The steam flows through the jacket of the trough and the hollow agitator system. Since no carrier or sweep gas is used, the unit has a thermal efficiency over 95%. The 358 pounds per hour of dried sludge

is discharged, via a second choke screw conveyor, to a disposal truck which carts it to a fertilizer plant.

The dryer requires very little operator attention, and with a constant feed volume and minimal moisture level variation, the dryer produces a consistent product.

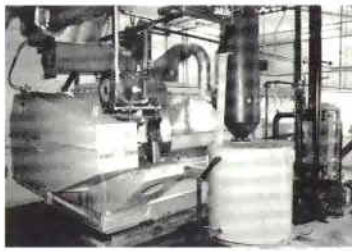


Photo 2

Komline-Sanderson also provided the accompanying vapor handling system to eliminate air pollution problems.

This consists of a counter-current barometric condenser (Photo 3, left foreground/Photo 2, center), and hot well. The non-condensable and steam vapors from the dryer pass through the barometric condenser, at 2442 pounds per hour, where the condensibles are turned back into liquid. The condensate drops into the hot well, and returns (at 112° F) to the waste water plant.

The water from the hot well is pumped, at 172 gallons per minute, through a plate heat exchanger (Photo 3, right foreground), and is sprayed back into the condenser (at 82° F) to continue cooling the vapors from the dryer. A cooling tower expels the heat from the heat exchanger to the atmosphere.

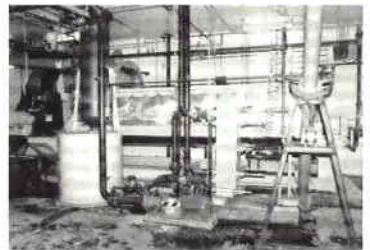


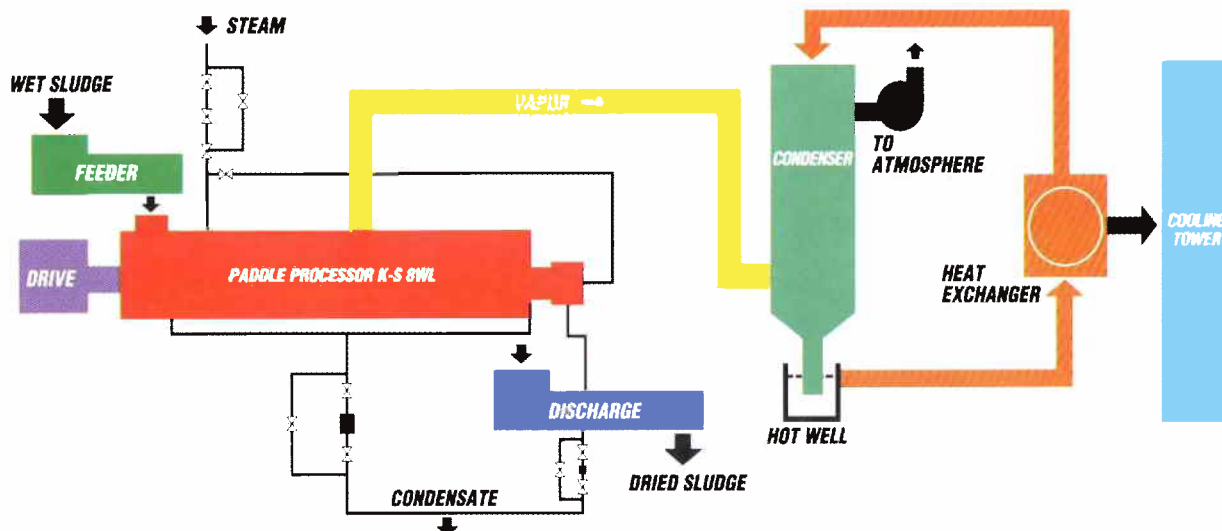
Photo 3

The paddle dryer helped this food processor comply with new stringent state environmental laws, and at the same time eliminate landfill costs, and generate income from the fertilizer ingredient sales.

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Photo 1



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