

When fine material screws fail to remove enough moisture from material, many sand operations decide to introduce a dewatering screen into their material flow.

The producers who own them already know that dewatering screens typically require little maintenance. While some dewatering screens resemble traditional sizing screens that use eccentric shafts to induce their shaking motion, the majority of dewatering screens use high-frequency vibrators and have few moving parts. The screens allow an operator to simply flip a switch and run them day in and day out. However, even low-maintenance machines still require some care, and the minimal maintenance needed is essential to their successful operation. In addition, operator error can affect both capacity and drying capability on these simple screens.

Opportunity for error

With either dewatering screen type, the theory behind water removal is the same; as the wet sand feed creates a deep material bed on the screen deck, the combined material weight and motion of the screen's throw work to squeeze water through tiny apertures in the screen media. At the same time, the throw moves the material down the screen's length. The desired result is that sand coming off the end of the screen should have a moisture content of 12% or less.

The most common complaints noted among dewatering screen operators — those of wet material and decreased capacity — are usually the result of not feeding enough material. If the screen cannot form a deep bed of sand, it will not be able to retain the product on the screen to remove the moisture and will also have trouble effectively moving the sand down the length of the screen. It is the vertical/diagonal vibrating motion of the screen, along with the inertia of the sand, that work to squeeze the water through openings in the screen media. The thinner the bed depth, the lower the inertia, resulting in lost and wet material — ultimately defeating the purpose of a



Dewatered sand coming off the end of the screen should have a moisture content of 12% or less

John Bennington, vice-president and general manager of GreyStone Inc., offers some dewatering tips to keep sand operations flood-free

dewatering screen.

Another common mistake among producers who are not familiar with dewatering screens is purchasing a unit based on desired plant capacity, rather than

current production capability. In order for the screen to handle the feed correctly and create the ideal bed depth, the producer must look realistically at the plant's current production figures. A high-capacity ►

Ideally, the dewatering screen's feed should create a deep material bed on the screen deck. The combined material weight and motion of the screen's throw work to squeeze water through tiny apertures in the screen media



Sand Processing



If the feed does not create a proper bed depth, the result will be wet material and decreased capacity. The thinner the bed depth, the lower the inertia, resulting in lost and wet material, ultimately defeating the purpose of a dewatering screen

dewatering screen that is too large for the feed will not effectively dewater or move the material.

Most dewatering screens allow for adjustment of the throw and the screen's angle of incline — from horizontal to about 5° uphill or downhill. Both adjustments can affect the capacity of the screen and its drying capability. If an operator adjusts the screen for a steeper uphill angle with less throw, it will require that less tonnage be introduced to the screen. The opposite is also true, with a horizontal screen or downhill angle with a harder throw allowing higher feed tonnage. Producers should initially work with the manufacturer to adjust the screen for the best angle and throw to meet their desired results. Later, if material properties change or production increases or decreases, the manufacturer and/or the equipment dealer can help determine the best settings and recalibrate the unit to operate under the new parameters.

Media maintenance

With sizing screens, the purpose of the screen media is for the material to pass

Because of their great speed and linear throw, vibrating motors generate a lot of force driving up and down. These motors, and their mounting apparatus, must be kept properly maintained or they can destroy themselves rapidly and create safety hazards



through the openings. With a dewatering screen, the goal is to retain the material on the deck, allowing only the water to filter through. Dewatering screen media does not wear as fast as media used on sizing screens, but when it does wear, it should be replaced immediately. Although dewatering urethane typically tends to wear at the surface of the screen, instead of the openings, any wear that does appear at the openings will allow saleable material to fall through the screen along with the water. In addition, because the openings are very fine, they can punch through or tear easily if stepped on, or if tools are dropped on the screen panels. In order to ensure retained product, the media should be examined regularly for signs of wear or holes, and worn or torn panels should be replaced.

Motor matters

Vibrating Motors: For dewatering screens that use high-frequency vibrating motors, operators need to know that these motors run fast, from 900 rev/min to 1,800 rev/min, depending on the screen and motor.

Additionally, their linear throw can equal up to 6g (six times the force of gravity, which means that one ton of sand is equal to six tons — or 12,000 pounds — of force), so they generate a lot of force driving up and down. If these motors and their mounting apparatus are not kept properly maintained, they can destroy themselves rapidly and create safety hazards.

As a standard step in safety and operating the machine efficiently, producers need to maintain the bearings on the motors, following manufacturer-recommended intervals. The motor's manufacturer provides greasing schedules for the bearings, as well as start-up procedures, which should be included in the screen manufacturer's operation and

maintenance manual.

Operators should ensure that bolts are tightened to the correct specifications. If the bolts or the frame are cracked, they should be repaired immediately. Most manufacturers will recommend checking the torque on the bolts prior to initial start-up when the unit is first installed, followed by regular inspections at least twice a year. The motor mount should be inspected regularly; if cracks are found, they should be repaired immediately.

Eccentric Drives: For eccentric-shaft dewatering screens, the maintenance of the motors and bearings is similar to that of traditional sizing screens. Manufacturers should provide schedules for maintenance, but most recommend checking the belt torque on the wheel case approximately four times a year. It is a good idea to check the drive belt and sheaves daily, as well as looking for leakage from the drive shaft seal. The pillow block bearings should be greased every couple of weeks or according to recommended intervals. Producers should also check the wheel case oil for contamination after 250h of operation and change it according to manufacturer specifications.

While dewatering screens are not very maintenance intensive, understanding how they perform and what maintenance is important will guarantee long-term success.

GreyStone dewatering screens

GreyStone Inc. offer three models of dewatering screens — the DS-488 (4ft x 8ft), DS-6010 (5ft x 10ft) and DS-7212 (6ft x 12ft) — to handle a variety of capacities and efficiently dewater up to 350 tons/h. Many concrete and masonry sands typically retain from 18–24% moisture, which requires drying time in the pile. At the process end, the GreyStone dewatering screen can cut moisture down to as low as 12% or less, providing saleable material in less than a day.

For further information visit: www.greystoneinc.com