

Maximize Your Screening Output On All Decks With Flex-Mat® 3

End Near-Size Pegging

More Throughput, Cleaner Retained Product

End Blinding, Get Far More Spec Product

Ever since Flex-Mat® 3 revolutionized screening efficiency on bottom decks, producers have been trying it on middle and top decks with great results. **Faster Throughput, Cleaner Product, Longer Wear Life, No More Pegging & Blinding, Increased Production Up To 40%.**

Maximize your screening output with Major Wire – The only screen media supplier with the full range of Flex-Mat-type openings and wire diameters to work on all decks. Contact your local Major Wire Authorized Dealer, Major Wire at (450) 659-7681 or visit www.majorwire.cc.

AGGREGATES MANAGER™



MAJOR WIRE INDUSTRIES LIMITED
ISO 9001:2000 Registered

Screen Maintenance Simplified

Poor screen maintenance can lead to inefficiencies and low-production volume. Proper practices keep your screen clean and your operation profitable.

When production fails to meet expectations, it's a common practice for producers to focus on their crushing operations. But, a frequent — and often overlooked — culprit in low-production volume is the screening operation and its performance efficiency.

What can impact a screening operation and lower its production? Inefficient screening and poorly maintained screens each can affect the success of any operation and its costs, no matter how much material is produced per hour. Lower production rates, poor product quality, complicated and expensive process add-ons, increased wear on other equipment, and higher labor costs are all outcomes of poorly performing screens. Frequent shutdowns to replace worn or broken screen cloth or to clean screens due to blinding, pegging, or clogging; or having in-spec product trapped in an endless loop — re-circulating in closed-circuit systems — all greatly affect production and cost producers millions of dollars in lost revenue each year.

Hidden costs

It might not be immediately obvious, but if a screen is not operating at its intended capacity, it can severely affect a producer's bottom line in a number of ways.

A blinded screen can reduce screen efficiency by 70 percent or more. So, an 8- by 20-foot screen deck suffering a 70-percent efficiency reduction suddenly is producing at the level of a 4- by 12-foot screen deck.

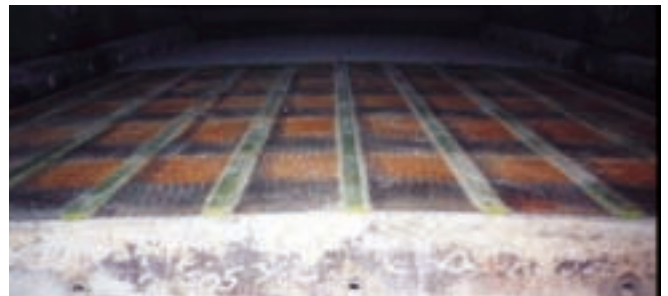
Further, a rule of thumb is that a fully loaded screen deck that is even partially blinded — say just 5 percent — will result in a total production loss equal to the percentage of the screen that's affected. This means a single screen deck blinded just 5 percent on a 500-ton-per-hour plant that produces 1.2 million tons per year will lose about 60,000 tons of that total production in spec product every year. At an \$8-per-ton selling price, this operation could easily lose \$480,000 per year in potential revenue from what seems like a small screen deck problem.

And, this example illustrates the effect realized from only one screen deck on one screen box. Multiply it by multiple decks



Photos courtesy of Major Wire

An operation screening limestone in Missouri experienced severe blinding, which required daily shutdowns of the screens for cleaning. This "before" photo reveals the blinding on the woven wire bottom deck.



A non-woven, self-cleaning, wire screen cloth eliminated the blinding problem and increased plant capacity, reducing the need to shut down the screen for cleaning.

Although many producers believe the opposite, maximizing screening efficiency is not rocket science.

and screen boxes for the true result of poor screening efficiency.

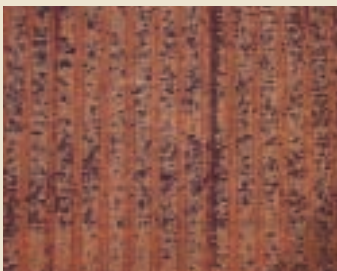
The cost of inefficient screening doesn't end there. Poor screening often leads to poor product quality or out-of-spec product, both of which can have multiple repercussions. On the plant side, these include the additional cost and time to re-screen the material, additional wear and tear on the equipment, the cost of re-circulating material through the crusher, lower prices, and even lost customers.

For the customers of the aggregates operation, an out-of-spec product could cause them to face stiff penalties and fines for using inferior stone, as well as delayed project costs while the stone is being replaced, often eliminating any hope for an early completion bonus. In addition, inconsistent gradations can cause asphalt and concrete mix design complications, typically requiring completed jobs or portions of jobs to be replaced at the contractor's cost.

The cost of inefficient screening can also severely affect a portable contract-crushing operation. For example, a 350-ton-per-hour portable crushing and screening plant working to fulfill a 500,000-ton contract would generally require 3,150 tons of production per day within a nine-hour day — and approximately 159 working days to complete the contract, working five days per week for a total of almost 32 weeks.

If the plant had even a 5-percent reduction in screening efficiency due to blinding or pegging, it could require the contractor to spend eight more days on the job to complete the project. Eight days might not sound like much, until electric power, diesel fuel consumption, wear on the equipment, and employee salaries are taken into account. And, those eight days are also lost to starting another contract. Because income for a portable crushing operation is often based on the number of contracts it can complete each year, every day lost directly affects its income potential.

Viewed in this light, an inefficient screen certainly takes on ominous possibilities.



Before: In a Minnesota sand and gravel operation, material was pegging on the screen, requiring the operation to regularly go through a tedious cleaning process. This photo shows the screen cloth is 50 percent pegged.

After: The woven wire screen was replaced with non-woven, self-cleaning screen cloth. This photo shows the panel one week after installation, with the pegging problem — and the need for frequent shutdowns — eliminated.

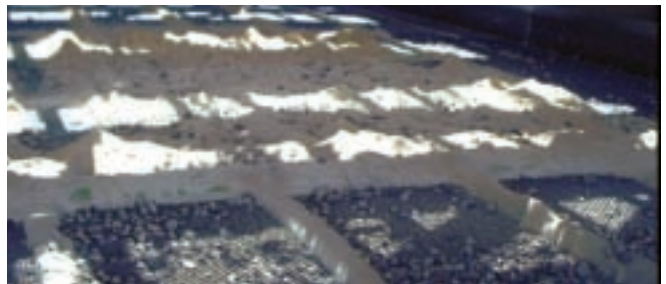


Not rocket science

Although many producers believe the opposite, maximizing screening efficiency is not rocket science. Simple, consistent screen box maintenance — and taking advantage of the more recent screen media solutions available today — can help ensure a higher level of in-spec product production.

Although there are many different types of screen media, from woven wire and polyurethane to punch plate and rubber, the vast majority of screen cloth used today is still traditional woven wire. When screens using woven wire “fail,” the problem often results from broken woven wire screen cloth — typically occurring for one or more of the following reasons:

- Poorly tensioned, loose screens that beat themselves against the crown bars at a high frequency;
- Inconsistent crown bar heights preventing a proper arc for the screen cloth to tighten and rest against;
- Worn out, damaged, or missing clamp bars and rubber channel that allow material to wedge between the screen cloth and screen box rails;



Non-woven, self-cleaning wire screen media was installed as a test, screening caliche in Nevada, with woven wire placed in between the non-woven panels on the same screen deck. This photo shows the woven wire and non-woven panels on the same screen deck after six weeks of production. The non-woven panels are clean. With a full installation of this type of self-cleaning screen cloth, shutdowns for cleaning can be greatly reduced.



One of the easiest ways for producers to check the performance of their woven wire screens is to look closely at the pile of discarded screen cloth for a history of recurring problems, such as broken wires, wires pulled from the hooks, blinding and/or pegging or unusual wear patterns.

- Wash plant spray bars that force a steady stream of water directly onto screen cloth wires from a close distance or that run when there's no aggregate on the screen deck leading to "drilling" holes into the wire;

- Too heavy of an impact on the feed end of the screen from material falling too great of a distance onto the screen or very large material falling onto small wire diameters, causing premature wear and breakage;

- Off-calibration of a screen's eccentric throw, damaged springs or rubber mounts, or decks affecting a screen's vibration can prevent an even flow and spread of material across the screen cloth for maximum throughput.

All of these problems are relatively easy to spot with frequent visual inspection of the screen boxes and screens, while they are in operation and when shut down. A formal inspection schedule, similar to those typically practiced with the crushing operation, will allow producers to make pre-emptive repairs and adjustments before problems begin to affect production. Frequent inspections also allow a producer to make repairs or replace parts when it's convenient, not during the height of the production day.

Producers should also check the performance of their woven wire screens. One of the easiest ways to achieve this is to look closely at the pile of discarded screen cloth for a history of recurring problems, such as broken wires, wires pulled from the hooks, blinding and/or pegging, or unusual wear patterns. **AM**

For a Web-exclusive list of tips on screen maintenance, go to www.aggman.com.

Gary Pederson is vice president of sales for Major Wire Industries Limited, Canadiac (Montreal) in Quebec, Canada, manufacturer of Flex-Mat 3 high-performance, self-cleaning screen media.

Weekly and Daily Maintenance

Daily maintenance routine

1. Check the oil level and add oil if necessary.
2. Check the breather caps for buildup.
3. Set the belt-tensioner spring tension at the recommended setting.
4. Free the screen box of material buildup beneath the vibrating basket.
5. Make sure the guards are in place and are in good condition.
6. Check the wire cloth draw bolts for proper tension.
7. Make sure the snubber rubber is in contact with the snubber plates.
8. Make sure the feed box is free of excessive material build-up.

Weekly maintenance routine

1. Inspect the wire cloth and feed liner for excessive wear.
2. Inspect the springs for excessive wear.
3. Inspect the drive shaft seal for leakage; add fresh grease.
4. Inspect the drive belt and sheaves for excessive wear.
5. Check the tag tension band for damage.

Source: Major Wire Industries Limited

Recent Developments

Maximizing a screen's efficiency has typically taken a backseat to extending wear life. Because woven wire screen cloth has been a low-cost commodity for many years, the focus has been on price and long life versus expanding the screen's efficiency. In fact, the use of polyurethane, rubber, and punch plate has increased because it can extend the life of screen cloth.

Through the years, woven wire manufacturers have developed various versions of woven wire screen cloth to try to eliminate or reduce the common production challenges created by material blinding, pegging, and clogging. These solutions have typically involved various designs of slotted screens — still woven, but with various combinations of crimp designs, rectangular slots, and special weave patterns versus traditional, uniform, square openings.

During the past 10 years, however, non-woven, self-cleaning wire screen media, such as Flex-Mat 3 from Major Wire Industries, has been developed.

This screen cloth employs single wires running horizontally from hook-to-hook, bonded in place with properly spaced vertical polyurethane or rubber strips, extending the length of the

screen panel. From a screen maintenance standpoint, when appropriately sized for the application, this new category of flexible, self-cleaning wire screen media has been able to greatly reduce, if not eliminate, many severe blinding, pegging, and clogging problems on screen boxes of all types, reducing the need for plant shutdowns to clean the screen. In addition, its wear life is said to exceed that of traditional woven wire up to three times or more because there are no cross wires with high-wear spots, as with woven wire. With increased wear life, shutdowns for screen cloth changes also will be reduced.

The key to the success of this screen media is two-fold. Because the cloth can vibrate, unlike rigid woven wire, it prevents blinding, pegging, and clogging, while still producing spec product. This type of screen cloth also generates greater throughput at a faster pace than woven wire because the design allows for far more open area per square foot than conventional woven wire. The more open area per screen available, the more capacity a screen has to size more product. For this reason, many producers are also using this type of self-cleaning screen media to raise their production rates, even if they don't have a blinding, pegging, or clogging problem.