Urethane screening media help provide effective control without affecting product quality, operating costs

Screening out noise, dust problems

By Bob Drake

Vibrating screens are common sources of noise and dust in pit and quarry operations. Contributing to the problem is the fact that screens are generally located on elevated structures, which tends to make dust more visible and allow noise to travel further. The result, too often, is complaints filed by neighbors and operating restrictions imposed by regulatory agencies or local governments.

Enclosures and wet suppression may reduce public relations problems, but may not be totally cost effective. Enclosures can be expensive to build and maintain, as well as complicate screen, crusher and conveyor maintenance. Excess moisture can negatively affect screening operations by blinding screens.

A New England producer, seeking a solution to the noise/dust problem, started switching to urethane screening media about two years ago. The change has drastically reduced plant noise—and complaints—and reduced blinding caused by water-mist dust control. Operating costs—based on longer wear life and fewer blinding problems—are also lower.

The greatest benefit, according to Leonard F. Tellone Jr., quarry manager for Balf Co., Newington, Conn.,

Balf Co.'s secondary plant (foreground) produces asphalt aggregate in a closed circuit with two 1560 Nordberg Omnicones, a Barmac vertical impactor and two 8 x 20 ft Nordberg screens fitted with Isenmann Flex-a-thon screens. A 100-ft screening tower can be seen in the background.

Panels can be replaced without time-consuming replacement of the entire deck

is that finer material will not build up on the urethane screens under moisture conditions necessary to effectively control dust. "Normally, the finished product on the bottom deck caused the most problems," Tellone says. "We found that after four or five hours of running, it (wire screen) would blind up to the point where it wasn't screening at all."

Balf's plant consists of a primary and two separate secondary systems: one for asphalt aggregate and one for concrete stone and other products.

In the primary plant, an 8 x 16 ft, triple-deck Deister box has been fitted completely with Isenmann urethane screens. Using 4½-in. openings on the top deck, 2¼-in. on the middle and 1⅝-in. on the bottom deck, Balf separates out stone for the two secondary plants (top deck overs to the concrete stone plant; middle deck overs to the asphalt aggregate plant).

The bottom deck of the 8 x 16 ft Deister is Isenmann's Isepren WS modular system comprised of 1 x 4 ft panels. The panels can be individually replaced as needed. This allows for damaged panels or panels in high-wear areas of the deck to be replaced without time-consuming replacement of the entire deck.

Balf's secondary plant, producing concrete stone and other products, utilizes two 6 x 16 ft triple-deck Deister screen boxes, three 5 x 14 ft triple-deck Allis Chalmers boxes, one 5 x 16 ft triple deck Allis Chalmers and one 8 x 20 ft Nordberg.

Isenmann urethane screens are used on the middle and bottom decks of the 5 x 14 ft units, the bottom deck of the 5 x 16 ft unit and the top deck of the 8 x 20 ft Nordberg. Wire screens are used on the rest of the decks; stainless steel for smaller sizes (7/16- to ⅝-in. openings).

The screens operate in closed circuit with a 7-ft Symons cone, 750 Allis Chalmers cone and 1560 Nordberg Omnicone crushers. A Barmac vertical impact crusher is also used for some products.

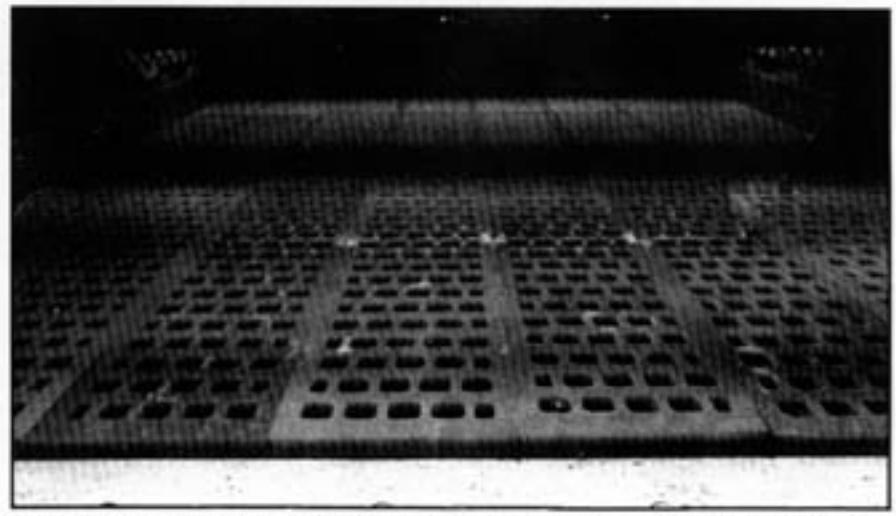
"We have been doing some internal (plant) changes," says Tellone. "Until I feel comfortable, I'm going to stay with stainless. Once I stop making changes, I'll be converting over to urethane, if only for the longevity of it."

Screen longevity plays an important role in determining the cost effectiveness of switching from wire to the more expensive urethane media. Tellone estimates that urethane is providing four to five times the life of wire cloth. Urethane screens on the bottom decks of the 5 x 14 ft Allis Chalmers boxes have lasted three years, Tellone says. (That plant is run at 550 st/h.)

"If I can prolong a screen change, then I can pay attention to the rest of the system," says Tellone. "Normally I'll sit down and do a wear pattern analysis. I'll project what I'll have to replace this or the following year. Usually you can justify the cost by the (urethane's) longevity."

Balf's secondary plant for producing asphalt aggregate, which averages 300 st/h, consists of two 1560 Nordberg Omnicones and a

Isenmann urethane scalping screens significantly reduce noise at the primary plant. Wear is comparable to stainless steel.



Balf uses Isenmann's modular system consisting of 1 x 4 ft panels that can be interchanged or individually replaced.

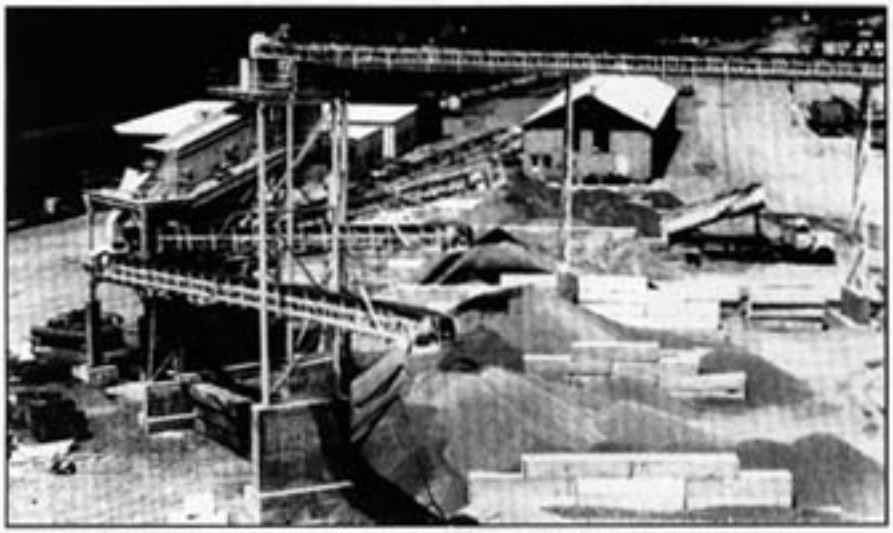
Effective control

Screen longevity plays an important role in determining the cost effectiveness of urethane

Barmac vertical impactor run in closed circuit with two 8 x 20 ft triple-deck Nordberg screens.

The middle and bottom decks of the 8 x 20 ft box are fitted with Isenmann's urethane Flex-a-thon screens. The thin membrane, pretensioned screen vibrates like a drum skin, according to the manufacturer, which prevents particles from sticking.

Balf has used the Flex-a-thon screens for 1½ years and they have shown little wear, according to Tellone. "In comparison, the stainless steel screens don't last," says Tellone. "I go through two changes a year with stainless."



Balf produces all products directly off of its screens. Flopgates and conveyors provide flexibility without crusher and screen changes. Many unwanted products can be recycled through the plant.

Pre-tensioned, thin membrane screens reduce blinding of fines, allowing more effective control of dust with water-mist systems.

Reduced blinding on the Flex-a-thon screens has allowed Balf to effectively use a water-mist system to control dust. "By increasing the water, I've been able to really control the dust off the screen decks themselves," says Tellone. "That's mostly where the dust comes from, right where the stone drops on the screen."

Noise has also been significantly reduced. Balf's facility is next to a residential area with the closest neighbor only 1,200 ft away. With the screening tower 100 ft above ground level, noise can be a problem. "When we had manganese screens up there, it sounded like a train going by," Tellone says.

Noise has also been reduced in the primary plant now that scalping of 18-in. rock is accomplished with urethane screens rather than stainless steel. Wear on the urethane scalping screens is comparable to the steel, according to Tellone.

Balf's Newington, Conn., plant was originally constructed in 1955. Major changes were accomplished two years ago and minor changes and fine tuning are still being done to maximize the facility's productivity and flexibility. ●

Advice on the use of urethane screens

Leonard F. Tellone Jr., quarry manager for Balf Co.'s Newington, Conn., facility offers the following pointers when incorporating urethane screening media into an aggregate plant.

- Regularly inspect the screens and clamping bars for wear. No screen is totally maintenance-free. A worn or punctured screen in a high volume plant can contaminate a lot of product in a day's time.
- When switching from wire to urethane, carefully check the product size to make sure specifications are being met. A slightly different-sized opening may be required. "Sometimes it pays to run a combination of sizes depending on the capacity of the screen deck," says Tellone.
- Use thicker material for the impact area of each deck. The next larger size screen or a blanked out section will help avoid punctures. The drop from a middle deck to a bottom deck can be significant—sometimes more than 3 ft.

Tellone has been trying the blanked out section in two screens. "It's been very successful," Tellone says. "It hasn't interfered with screening capacity as far as the decks below. It gives insurance that it will never puncture through."

- Protect urethane screens with fire-proof blankets when welding close to them. Such a high heat source will easily damage the screens.
- Maintain screen tension. "Once you lose tension, the screens start whipping against the steel and the screen gets damaged," says Tellone.