

The Science of Screening

As community neighbors and regulators continue to scrutinize dust and particulate emissions, a growing number of aggregate producers have opted to implement dust control measures within their facilities. While dust suppression technology helps keep neighbors happy, workers protected, and operators in compliance, it can adversely affect production.

“Adding water mist to the process makes screening that much more difficult,” says Marc Lovallo, vice president of sales, for Spartanburg, S.C.-based Polydeck Screen Corp. “When you add moisture to the material you want to screen, it makes it want to stick together. It particularly wants to stick on the screens, a condition called blinding.” When plugging or blinding occurs, operations personnel must climb into the screen to clear the blockage before the plant can be started up again.

Bottlenecks in screening operations are particularly problematic for producers who are trying to meet the demand for higher production levels even as state departments of transportation are developing increasingly strict specifications. They face the need to produce more — and better — stone.

Dan Johnson, who oversees operations for Lake City, Fla.-based Anderson Columbia Co., Inc., deals with both of these issues on a regular basis. The company’s aggregate operations feed its contracting arm, which is one of the top 200 contractors in the United States. Between 90 and 95 percent of the stone produced at Anderson Columbia’s largest quarry in Georgia is shipped to the Panhandle state where 80 to 90 percent is used for road construction. “Florida probably has the tightest quality control targets that I’ve ever dealt with,” Johnson says.

To improve both quality and quantity of production, many producers are fine-tuning their screen circuits with the use of screen media. During the last 30 years, an increasing array of choices has been available as new synthetic and rubber screen media options were introduced.

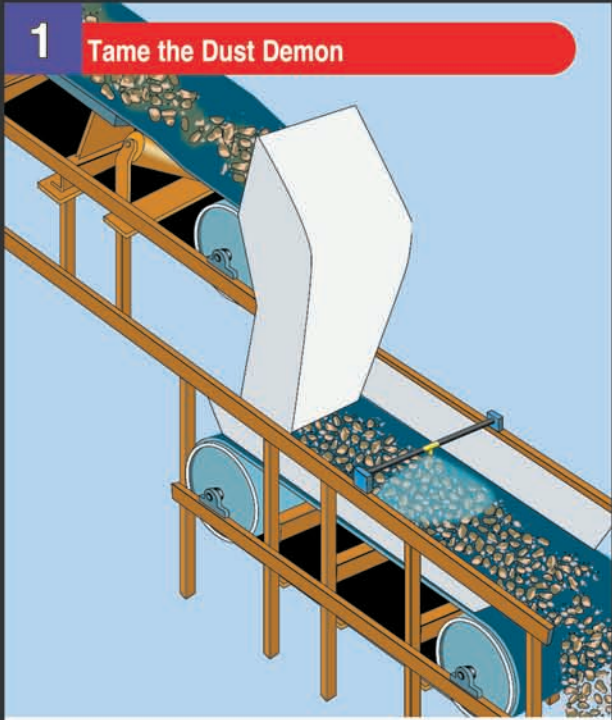
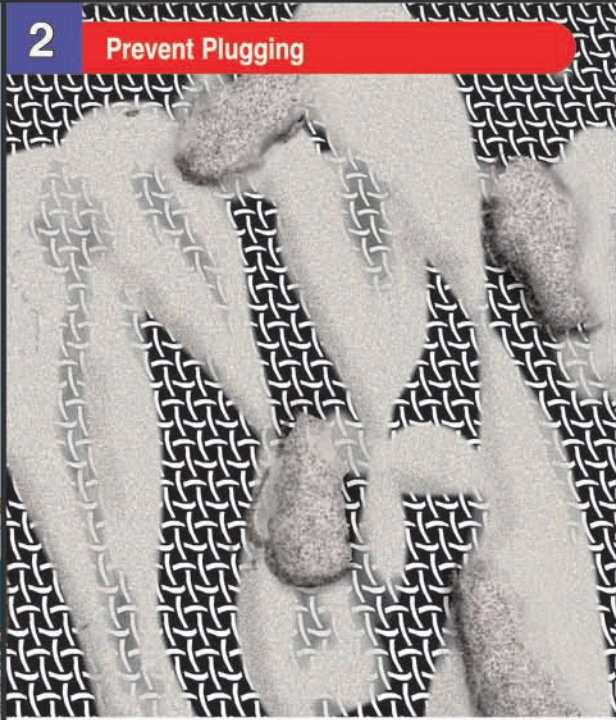
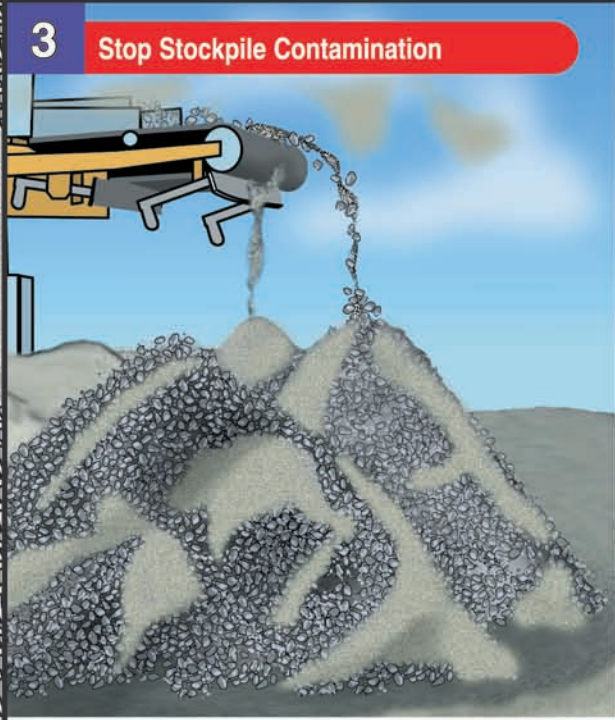
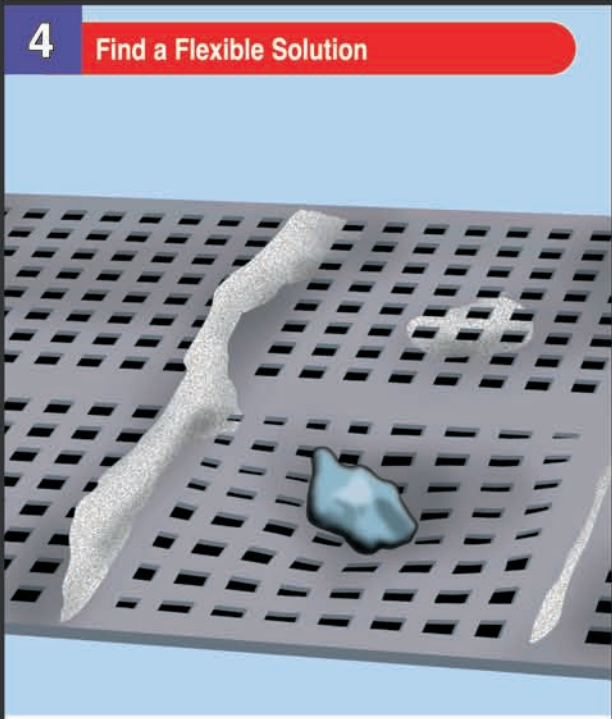
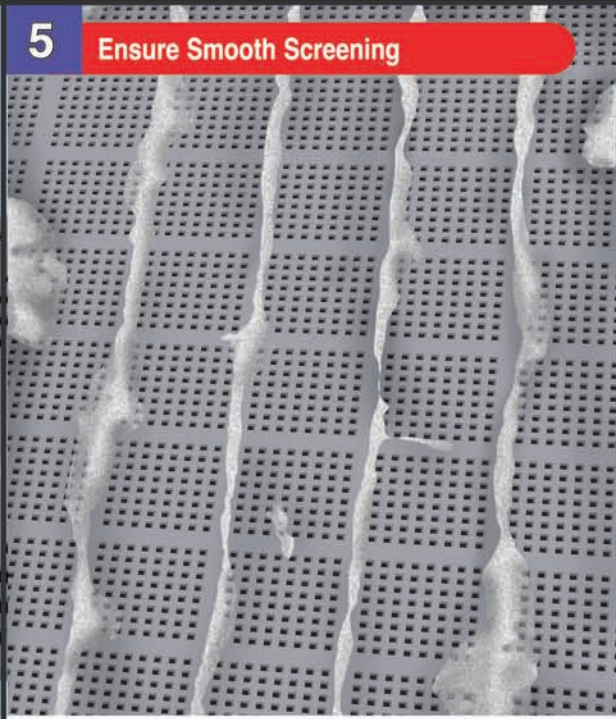
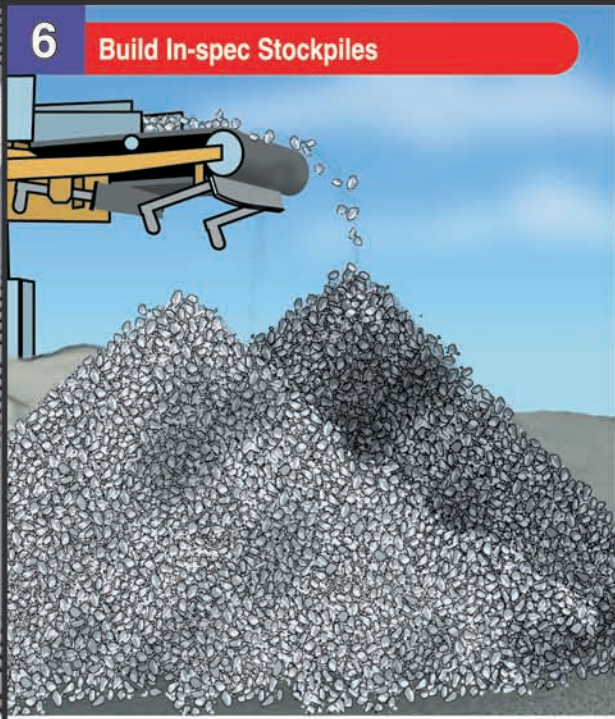
Early synthetic media may have seemed like the equivalent of a polyester pantsuit. It was favorable in terms of wear, but presented a number of problems on a day-to-day basis, including the smaller amount of open area.

While other industries embraced synthetic screens more quickly than the aggregates industry, overcoming the loss of open area was critical to gaining acceptance in this market. Beginning around 2000, synthetic media was developed that featured comparable open area to that available in wire screens. Since then, the combination of increased production and greater durability has helped synthetic screen media to grow in acceptance, as well as market share.

The trick is to work with a screen media supplier to figure out the right combination for the operation’s unique needs, says Dan Brodeur, quality control supervisor for Massachusetts-based P.J. Keating Co. “Ninety-nine percent of the time,” he says “you can meet specifications and save money.”

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Unlock Your Screening Capacity

 1 Tame the Dust Demon As producers increasingly implement misters and other water-based dust controls, they must offset the impact of wet material on their screening operations.	 2 Prevent Plugging Wet material may clump on the screen causing blinding and reduced screening efficiency. If left unchecked, this can dramatically decrease an operation’s overall production capacity.	 3 Stop Stockpile Contamination A secondary impact of inefficient screening is a greater amount of fines ending up in the stockpile. As material specs continue to become more stringent, this can lead to unsaleable material.
 4 Find a Flexible Solution Flexible screens are gaining acceptance based on their ability to prevent blinding. Many producers also find that synthetic screens offer a long wear life.	 5 Ensure Smooth Screening Through the right combination of screen media and machine, producers can consistently and efficiently separate material and prevent screening from becoming an operational bottleneck.	 6 Build In-spec Stockpiles The ability to generate in-spec stockpiles creates a valuable commodity, as well as an effective marketing strategy for producers.

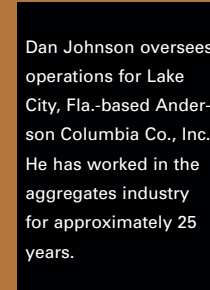
OUR EXPERTS



Dan Brodeur is quality control supervisor for Massachusetts-based P.J. Keating Co. He has been with the company for 14 years and oversees quality control for its four quarries in Massachusetts and Rhode Island.



Mark Lovallo is vice president of sales, for Polydeck Screen Corp., based in Spartanburg, S.C.



Dan Johnson oversees operations for Lake City, Fla.-based Anderson Columbia Co., Inc. He has worked in the aggregates industry for approximately 25 years.

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Voices of Experience

Dan Brodeur

While many producers look for increases in production, consistency is paramount for Dan Brodeur, quality control supervisor for Massachusetts-based P.J. Keating Co., a Division of Pike Industries and part of Oldcastle Materials, Inc.

As a vertically integrated operation, most material from the company's aggregate operations feeds its hot-mix plants and must meet the state's quality analysis specifications. "When it comes to statistical specifications, consistency is everything," he says.

Prior to using synthetic screens, Brodeur says that consistency was difficult to achieve, so he experimented with an assortment of screen media, including urethane panels, rubber panels, and polyurethane panels.

Since switching to synthetic screen media, those problems have been eliminated. "Consistency is at an all-time high," he says when describing the results of the operation's gradation tests. "We've cut that standard deviation in half."

Screens in the company's Lunenburg, Mass., operation were converted to synthetic screens over a three-year window. After experimenting with new media with the plant's 3/4-inch stone, screens throughout the plant were changed out.

Brodeur says that it took about half an operating season to determine the right media. "The stuff they make the media from is very important," he notes. "In one of our operations, we run a rubber panel while in another operation we run a urethane. It's just a different kind of stone, and it takes a little time to figure out what you need."

While Brodeur says the capital investment was significant, it paid off in terms of maintenance. At the company's Lunenburg operation, annual screen costs have dropped from \$100,000 to \$60,000. Throughout the company, screen costs have dropped by 20 to 40 percent.

Marc Lovallo

"The process of screening in an aggregate operation can have a huge impact on production of spec material, tonnage produced, consistency of product, and environmental issues," says Marc Lovallo, vice president of sales, for Spartanburg, S.C.-based Polydeck Screen Corp. "The DOTs have become very tight on what is considered spec material, so the allowable ranges have gotten more narrow. It's put more pressure on the operators to make better quality stone."

To meet those tighter specs and improve production rates, Lovallo says that a number of criteria need to be considered, including the following: amount of moisture in the material, type of material, percentage of fines in the feed, how the material is fed, speed and stroke of the screen, and production rate.

"All of these are major factors that have to be looked at and analyzed to determine which screen panel design you apply and how much open area is required to gain the desired result," Lovallo explains.

Once this data is gathered, it is loaded into a proprietary software program to compare the data with what has worked for other sites with similar conditions. "We've been developing a database that helps us look at these factors and analyze how changes in the screen panel configuration will impact the end result which is the spec of the pile," he notes.

Screen media design also plays a large role in both throughput and product consistency, so tweaks such as a different screen arrangement or a different size of opening are also worthwhile considerations. "You have to be able to analyze the screens and determine what you can do to gain production and tons per hour," Lovallo says. "Producers are looking for ways to increase production and quality while cutting costs. The ultimate goal is to be able to do it consistently."

Dan Johnson

Screen wear, blinding, and stockpile contamination issues use to hamper production at Anderson Columbia Co., Inc.'s quarries in Georgia and Florida, according to Dan Johnson who manages aggregate operations for the company.

"When a screen wears out prematurely, we'd get contamination," Johnson says. "We'd have to shut down, clean out the stockpiles, change screens, and get going again. That just kills you in terms of your productivity."

Johnson says that as the screens would blind, the fines would be retained, and the material would be very fine. After shutting down to clean the screens, the resulting material would be coarser. That cycle might repeat two to three times a day, with shutdowns ranging from 20 minutes to more than an hour. "During the rainy season, it could cost us close to a day a week," Johnson adds.

After moving from wire to polyurethane screen cloths, screen life has been extended from four to six weeks to 10 to 12 months. "It's been pretty dramatic," Johnson says. "We used to have to send out two different types of products — certified and non-certified. Now, virtually everything we send out is certified material."

Johnson says that he's changed out the screen decks throughout most of the secondary plant as well as a portion of the primary operations. The key area to target was the fine screening because it was where he had "the most issues and the most to gain."

The improvements of the company's screening operations also ripple throughout the rest of the plant. Because the maintenance crew is spending significantly less time changing out screens, they are now focusing on improving other areas of the operations. Johnson notes, "Uptime on the rest of the plant has improved as well."

AGGREGATES
MANAGER

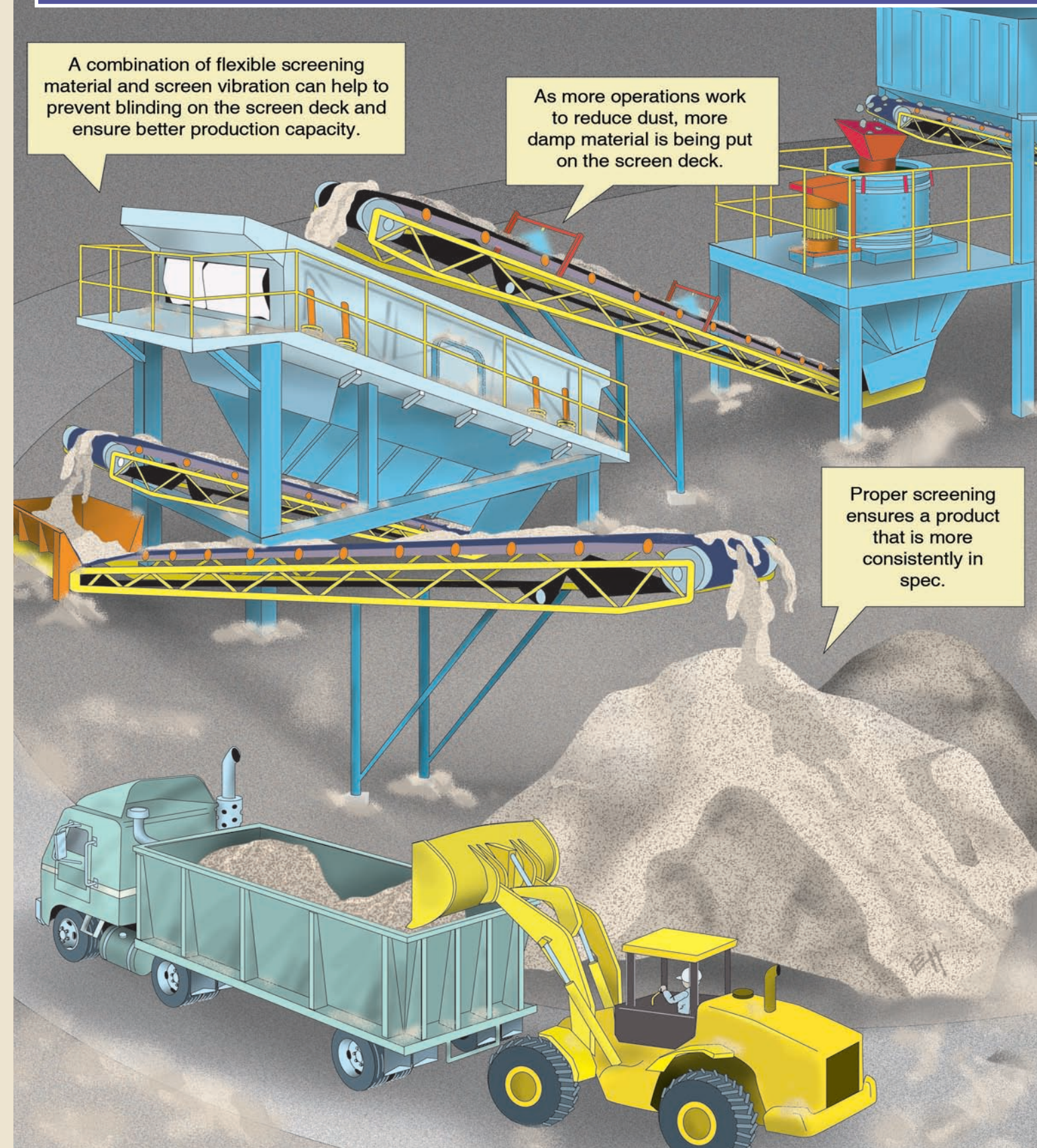
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by Therese Dunphy, Executive Editor

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