

Ultrasonic sieving increases the process quality

Reliable functionality, even with demanding products

PLASTIC WELDING

METAL WELDING

CUTTING

CLEANING

SIEVING



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Bronschhofen (CH), 05/2020

Sieving powders is an important process step in many industries, not only to remove foreign matter but also to achieve a homogeneous particle size. Therefore, sieving is used wherever powders are produced or processed. It is particularly important that the sieving process does not become a bottleneck in the entire production process. In this case, a practical solution is ultrasonic sieving. When selecting the ultrasonic systems, however, it is important to ensure that they are adapted to the respective application and efficiently clean the screens without clogged particles. Then process safety and product quality can be significantly increased, as shown by the following example from the chemical-pharmaceutical industry.

At the Gernsheim site in the Gross-Gerau district of southern Hesse, Merck KGaA produces performance materials, e.g., for the automotive and cosmetics industries. These inorganic, powdered pigments must be carefully screened to ensure the right product quality. "Unfortunately, about two years ago, the sieving process at our three plants proved to be a production bottleneck," recalls Jure Poljanšek, plant engineer at Merck. With the system used at that time, consisting of a sieving machine and ultrasonic sieving equipment, the process was not stable. Products often had to be screened several times to achieve the desired yield because the proportion of good product in the oversize particle discharge was clearly too high.



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- 01 Powder for 3D printing with application from the 3D printer
- 02 Screen resonator with overhead ultrasonic converter
- 03 SG47 Ultrasonic screen generator



"Cleaning the screens was insufficient. In addition, the screen mesh was not robust enough for our application, and the amount of maintenance was accordingly high," adds Poljanšek.

- 04 View of powder production at Merck
- 05 Operation via tablet (Telsono Flex Screening)

Test phase shows the potential of an optimized sieving process

Looking for a more practical solution for the products that are difficult to screen, the plant engineer contacted the ultrasonic specialists at Telsonic AG. The company has more than 20 years of experience in this field, can offer tailor-made solutions for all powder sieving tasks, and can support the user from the design phase to integration, so that the respective solution is perfectly matched to the application. Once the key data such as installation conditions, product properties, and particle size distribution were known, the right conversion solution was quickly found for Merck as well. Right after the first consultation, the test phase of the SONOSCREEN® plus components in pigment production in Gernsheim was a settled matter. "Of course, we were delighted with this quick response to our inquiry," recalls Poljanšek.

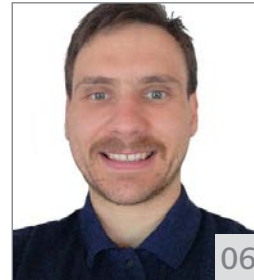
The test phase soon showed what the right ultrasonic technology can mean for the sieving process. After the retrofit, throughput increased by 50%, and the proportion of oversize particles dropped from over 20% to below 2%. In other words, there was significantly less good product in the overflow, and little to no re-sieving at all was necessary. "At the same time, technical expenses have been reduced by more than 80% because the amount of maintenance has been significantly reduced," reports the plant engineer. Moreover, the new solution could be integrated into the existing machines without any problems.

How is sieving performed?

The ultrasonic sieving system consists of three components: the generator, the converter, and a matching screen resonator with installation frame and screen mesh. The generator converts the normal mains voltage into high frequency and transmits it to the converter. This in turn converts the high frequency into ultrasonic vibrations via the piezoelectric effect, which then causes the screen frame to vibrate via the resonator. The oscillations are transmitted to the screen mesh where they are evenly distributed over the entire surface. In the pigment application described, the screens have mesh widths of 32 and 50 μm , and the SONOSCREEN® plus system operates at a defined resonance frequency of 36 kHz. If the screen is more heavily loaded with sieving material, the capacity can be automatically adjusted. "This ensures efficient screen cleaning," says Poljanšek happily.

It is simple to operate. The sieving process is started manually by pressing a button. The corresponding programs are pre-programmed in the generator. As a result, employees do not lose any time during sieving, and no special training is required. In principle, anyone can operate the sieving machine. However, with the included "Telso® Flex" software, the process parameters can also be specifically tailored to the application. "We have now had the Telsonic ultrasonic sieving system in operation for some time, and the results are just as excellent as they were during the test phase," concludes the plant engineer Poljanšek. Currently, other company sites that also produce pigments are dealing with the sieving issue as well. This could result in a switch to the technology used in Gernsheim, which is working effectively here in day-to-day use.

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