

# Making the Grade in the Medical Market

**While providing ultra fine titanium powder for medical implants, Reading Alloys optimizes particle size distribution, throughput and material recoverability with a new ultrasonic deblinding system from Russell Finex**

As an aging population requires more hip, knee and teeth replacements, suppliers to the growing medical implant industry are noticing an increased demand for fine grade titanium. Whereas powders in the range of 150µm/100 mesh are suitable for many industries, the medical field requires even finer material, which proactive suppliers, such as Reading Alloys, are stepping up to produce.

“Medical customers such as plasma spray coaters increasingly require unique particle size distributions (PSD) below 75µm/above 200 mesh because they are looking to produce very fine coatings to help join bone to the implant surface,” explains Dr. Colin McCracken, Development Manager of Powder Products at Reading Alloys, a leading supplier of high purity titanium and specialty alloy powders. “This is often the case for fine grade powders where laser PSD measurement is preferred.”

Different coating process equipment and process routes require unique, exceptionally narrow PSD for fine powder to correctly bond with the implant surface, according to Dr. McCracken. Medical coating users often choose five or more PSD specifications depending on the medical device treated. To satisfy this need, Reading Alloys sought to ramp up its capacity to produce titanium and alloy powders from 300µm/50 mesh to 45µm/325 mesh. However, the company noticed its existing vibratory screeners were experiencing problems attaining the necessary particle size distributions, throughput, and material recoverability.

“It was difficult to prevent the screeners from blinding, especially at the finer mesh sizes,” says Charles Motchenbacher, Technology Manager for Reading Alloys. “We tried using a ball deck to agitate the bottom of the screens, but this contaminated the undersized powder, so it could not be used.” Screening multiple times lengthened the company’s manufacturing process, which hindered its high production, 24/7 operation.



The Russell Vibrasonic Deblinding System being used at the Reading Alloy plant, with their existing screener

- Eliminates mesh blinding and enables accurate separation down to 20µm
- Improves screening efficiency and material throughput
- Reduces downtime and increases screen life as manual mesh handling is eliminated

In search of a solution, Reading Alloys turned to a state-of-the-art, ultrasonic screening deblinding system from Russell Finex ([www.russellfinexusa.com](http://www.russellfinexusa.com)) of Pineville, North Carolina.

Screening efficiency is enhanced with the Russell Vibrasonic 2000® system, which is available ATEX certified to operate within areas designated as zone 20, 21, 22, 0, 1 and 2. The system uses a combination of ultrasonics and conventional vibration and can be retrofitted onto any new or existing vibrating separator/screener.

By using an acoustically developed transducer, an ultrasonic frequency is applied directly to the screener mesh to break down surface tension, effectively rendering the stainless steel wires friction free. This eliminates mesh blinding and enables accurate separation down to 20µm on even difficult powders, while maintaining product consistency. As the machine does not have to be stopped for operators to manually clean and handle the mesh, downtime is also reduced and screen life is prolonged.

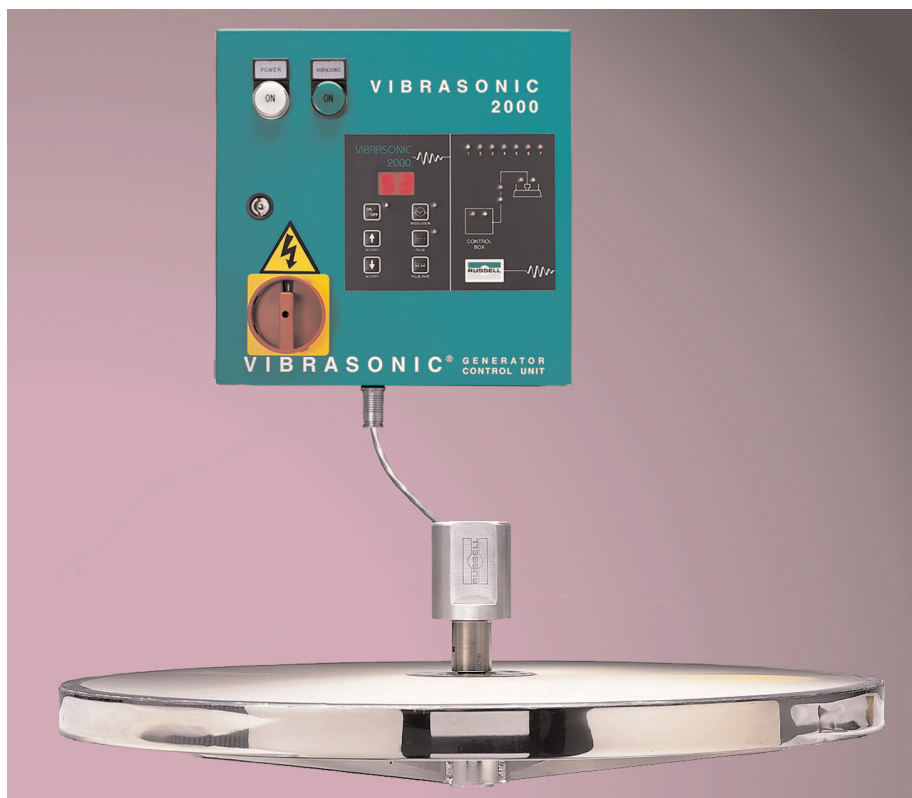
“The Vibrasonic system has helped eliminate blinding at the fine mesh sizes/narrow particle size distributions required by the medical market, all the way to 45µm/325 mesh,” says Motchenbacher. “It has enhanced our material throughput to the point where we can meet specified requirements in virtually a single screening pass, while improving material recoverability.”

Motchenbacher appreciates the ultrasonic screener debinding system’s ease of operation and its ability to provide precise control over the production process.

“By attuning the system’s controls to meet the different setups of our material and equipment, this has enabled us to match speed and feeding parameters to our processes,” says Motchenbacher. “As a result, we have optimized production.”

“With the Vibrasonic system, we have been able to work with medical customers to achieve their specifications for fine powders and tight particle size distributions,” adds Dr. McCracken. “Any manufacturing process requiring precise, efficient screening below 150µm or above 100 mesh should consider such a system.”

Russell Finex has over 70 years experience in fine mesh separation technology. After inventing ultrasonic debinding of meshes over 30 years ago, Vibrasonic technology is now used in the processing of metal powders, pharmaceuticals, food, chemical powders, toner powders, electrostatic powder paints, ceramics and in a variety of industries.



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