SUPPLIERS’ TIPS

What type of size reduction equipment is suitable for my sanitary process?

The most important factor when supplying sanitary equipment is the customer’s ability to access the equipment. This applies to how the equipment is integrated within the process, how the equipment is serviced, and the ability to clean the equipment in place.

Integration. Building equipment to fit within an overall process often comes with space constraints with the equipment footprint, especially if the installation is a retrofit. Many equipment suppliers offer standard products, limiting the ability to adapt to sanitary requirements. Scalable equipment that is also customizable is a huge benefit to the client, even when building new systems. Customizing aspects of equipment, such as drive motor location, rotation direction of the equipment relative to the system, feed and discharge chutes, mill ports for water flushing or nitrogen purge, and other features is common.

Accessibility. Routine maintenance of the internal wear components is critical to maintaining consistent particle size distribution in a mill. Replacing the core components or rotating those components in place is a must. Ensuring that the parts are simple to maintain without major equipment teardown is a key factor. To access these components, use a swinging-door style or other access panel to make equipment maintenance as easy and ergonomic as possible.

Cleaning. The ability to clean in place is an important feature for sanitary size reduction equipment. This can mean that a liquid may be used to flush the system or operators may clean the equipment during scheduled maintenance or between batch processing. Minimizing voids, or areas that material can accumulate, within the sizing chamber is a valuable equipment feature to consider when selecting the equipment type and configuration. Depending on the material being processed, equipment can be customized for various applications where preventing bacterial growth is important, for example special gasketing may be required or some other custom feature.

There are several key characteristics that make a lump breaker or other size reduction equipment suitable for a sanitary process. Start with a hygienic design that’s developed specifically for sanitary installations. These designs typically feature either Type 304 or Type 316 stainless steel construction for extra corrosion-resistance with food-quality seals and 0.8 Ra internal polishing. This smooth finish, along with food-quality seals, prevents materials from building up inside the machine and helps avoid issues with contamination. Of course, cleaning is paramount in a sanitary process, so it’s critical that the interior can be quickly and easily accessed to allow for complete cleaning and inspection.

Jet mill is a very suitable equipment option for sanitary size reduction for dry powders below 45 microns in size. Jet mills have three distinct advantages over other particle size reduction techniques.

1. A jet mill uses particle-on-particle impact for size reduction with no media or screens. This method decreases the opportunity for any impurities or contamination during processing.
2. A jet mill cools the temperature of the air leaving the jets to about -200°F due to the Joule-Thomson effect, and the material leaves the mill no warmer than the air used for the grinding.
3. A jet mill can have all material contact surfaces and FDA-grade O-rings that comply with 3-A sanitary standards, Type 316L construction, and machined one-piece construction where necessary to meet stringent USDA standards.

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