

Contained Active Freeze Drying could revolutionise pharmaceutical materials drying

A new method of lyophilisation or freeze drying that uses a single, sterilisable, closed vessel to deliver lump free, fine powder product has the capability to revolutionise the production of bulk pharmaceutical powders. With the benefits of improved operator safety, reduced equipment requirements and high quality, contaminant free end product results, the proven, Active Freeze Drying technology, from Hosokawa Micron, is making pharmaceutical manufacturers worldwide reconsider their existing tray type freeze drying methods.

Hosokawa Micron's active freeze drying technology incorporates the use of a jacketed and stirred dryer and collection filter. Material is frozen quickly inside the vessel. Energy needed for sublimation is applied through the jacket and distributed efficiently throughout the product by the stirrer which moves the finished dried material, in the form of a fine loose powder to the filter.

Hosokawa Micron's Active Freeze Drying system is capable of drying solutions, dispersions, pastes and wet solids with successful applications including antibiotics, APIs, proteins, collagens and electrolytes.

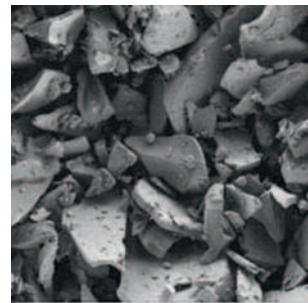
A Contained Freeze Drying System

Gerard Geurtsen, Senior Application Engineer at Hosokawa Micron, explains why this unique closed lyophilisation process is creating such intense interest from pharmaceutical manufacturers.

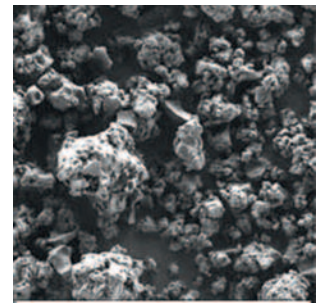
"Every production step is completed within a single, sterile closed chamber. There is no dust to compromise operator safety. Nothing can enter the sealed system to contaminate the product within. Wet product is transferred from a reactor vessel, so no contamination risks associated with manual handling are introduced and aseptic operation enabled. When the vacuum is broken, on cycle completion, the finished dry powder is discharged directly into a container that was sterilised along with the full system internals before product entered the system. There is no requirement for additional containment equipment to protect operators or product for this pack-off stage."

Lump Free Finished Product

Unlike the hard baked/crusty material resulting from tray drying the final product from the Hosokawa system is loose, free flowing and requiring no additional crushing stage. A classification stage may not be required as particle size of the final product is often extremely fine and uniform. The product is very often porous and the easy dissolution facilitates for use in injections etc. Without the need to introduce a milling stage the product is not damaged – we achieve 'drying without harming' of even the most sensitive, delicately structured products and living organisms.



API in the Tray Freezer Dryer



API in the Active Freezer Dryer

Aseptic Processing

The fully contained system allows for aseptic processing. Cleaning of the system is easy and effective. There is no need for operatives in suits to be involved. Spray nozzles in the drying chamber start the cleaning and sterilisation process on batch completion. SIP is achieved by pressurised steam or vaporised Hydrogen Peroxide. Quick drying times due to the high rate of heat transfer, simple filling and discharge plus the speed of system cleaning ensures volume throughputs are achievable with this 'single operator', system.

Cost Efficient

The Active Freeze Drying process is often faster and always less labour intensive than the traditional tray freeze drying process; producing lump free, free flowing powders in one step. Consequently handling times are shorter and simpler thereby saving time and money. The system is compact to leave floor space free for other operations and the benefit of a simplified system means there is less equipment to purchase.

Try Before You Buy

Hosokawa Micron offer a 'try before you buy' opportunity supported by extensive test and toll processing facilities for, initial product tests, product development and customer trials. Explains Gerard Geurtsen, "Our test centre includes 1, 5, 60 and 800 litre units available for customer tests and to demonstrate scale up potential. We are pleased to work closely with you to assess the specific benefits of Active Freeze Drying of your products."

ACTIVE FREEZE DRYING



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