

## Pulse Drying Offers Benefits For Food Products

**P**ulse Combustion Systems, PCS, recently announced it has been working with some of America's top food companies to demonstrate the benefits of pulse combustion spray drying.

PCS President Jim Rehkopf said, "Many mineral and specialty chemical manufacturers understand the advantages of pulse drying compared to conventional spray drying techniques. Now, food manufacturers are seeing firsthand the superior flavor, texture, and performance characteristics of pulse-dried powder ingredients."

The PCS pulse combustion dryer makes a superior powder as a result of two fundamental advantages over conventional drying technology. First, atomization is accomplished using the gas dynamics of the dryer, imparting zero mechanical shear to the feed material. There are no high-pressure pumps, no orifices, and no rotary disks. Second, there is tremendous turbulence in the drying zone, creating exceptional heat transfer rates between the drying gas and the water to be evaporated. This results in very rapid drying, short residence times, and low product degradation. Temperature sensitive materials such as egg whites are especially good candidates for pulse drying.

In addition to making better powders, food manufacturers can achieve lower utility costs due to higher throughput, and lower maintenance costs due to the pulse combustor's low-pressure feed system (the highest pressure in a PCS Dryer is 3 psi, and the highest rotational speed is 1,800 rpm on a one-horsepower motor).

For a major fruit processor, PCS

recently made powders from concentrated fruit byproducts, which are used both as nutraceuticals and natural colors. These materials are very difficult to spray dry because of their high-fiber composition. Yet they were easily pulse-dried with excellent retention of properties, and great coloration, flavor and texture.

For a major producer of oily botanical extracts, PCS has produced free-flowing powders with low levels of excipients, and therefore high concentrations of the desired compound.



Through a strategic alliance with a major supplier of evaporators to the dairy industry, PCS is developing the capability to perform single-stage drying of high-solids cheese-making byproducts, and to dry nonfat milk at concentrations significantly above current methods. Increasing the solids by evaporation prior to drying greatly increases dry powder throughput and significantly reduces per-pound drying costs.

In a boon to the nutraceutical and biotechnology industries, PCS has shown that it can dry liquids containing delicate proteins without degrading them, thereby offering a low-cost alternative to freeze drying.

PCS performs drying tests for customers in its state-of-the-art pulse drying facility in Payson, Arizona. In addition to a pilot dryer (50 pounds per hour evaporation), PCS has recently commissioned its new Model P-1 production-scale dryer. The P-1 dryer is 32 feet tall and operates at a heat release of one million BTU/hour. The all-stainless steel dryer evaporates water at a rate of 500 lbs./hour. The unique clamshell design allows the dryer to be completely opened for easy cleaning between demonstrations. The dryer features a state-of-the-art control system and three remote monitoring cameras that allow customers to view all stages of powder production. Ken Price, VP Sales and Marketing, explains, "The commissioning of our new production dryer removes the uncertainty about scale-up from successful pilot runs and full-scale production. We also make this dryer available for toll-processing, enabling customers to put powders into the marketplace even before their new PCS dryer is installed."

Over 100 products have been successfully dried in PCS's pulse dryer. Manufacturers may visit [pulsedry.com](http://pulsedry.com) to learn more about the dryer and review a list of dried materials. Lab facilities are described and further information can be requested directly from the site. For more information, contact Ken Price at 415-435-4225, or via e-mail at [kprice@pulsedry.com](mailto:kprice@pulsedry.com).

**Pulse Combustion Systems,**  
135 Eye St., Suite B, San Rafael, CA 94901  
(877-854-1062)