



**Spraying Systems Co.**  
Experts in Spray Technology



Spray  
Nozzles



Spray  
Control



Spray  
Analysis



Spray  
Fabrication



## **A Guide to Spray Technology for Pharmaceutical Processing**



## Optimized Spray Performance in Pharmaceutical Processing

Spray systems are often regarded as simple on-off valve and regulation processes. In fact, spray nozzles are precision components engineered for specific process conditions. Because spray nozzle performance affects the quality of many finished pharmaceutical products, there is a constant need for spray nozzles to perform according to the highest possible standards.

As the world's expert in spray technology, Spraying Systems Co. has partnered with leading pharmaceutical manufacturers and researchers to develop new spray products that improve product quality and process efficiency. With these new technologies in hand, you'll be able to:

- Run longer without build-up or bearding on nozzles
- Reduce installation and maintenance time from hours to minutes
- Save downtime, product waste and labor costs
- Comply with FDA sanitation requirements

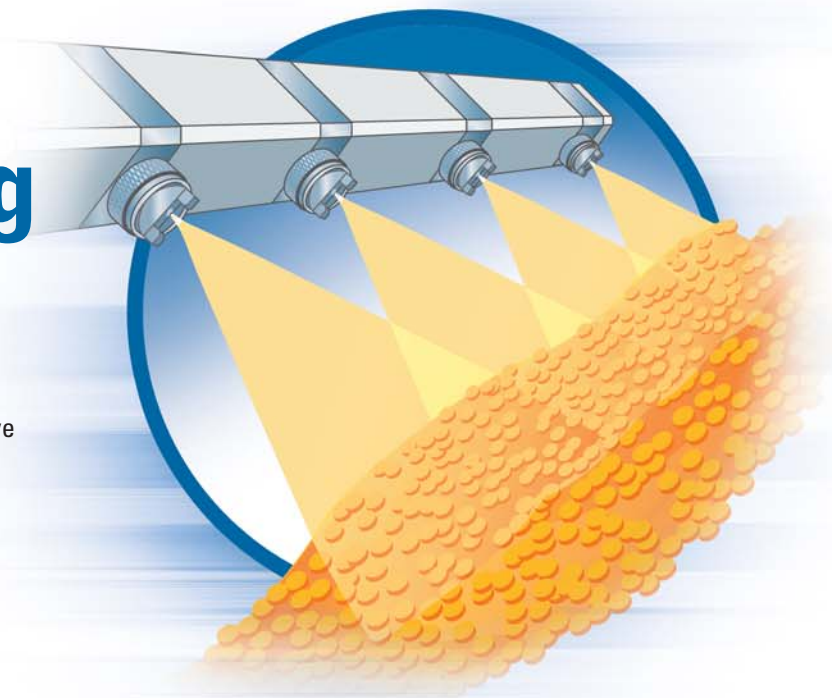
This bulletin provides an overview of our newest technologies for tablet coating, tank washing and spray drying applications.

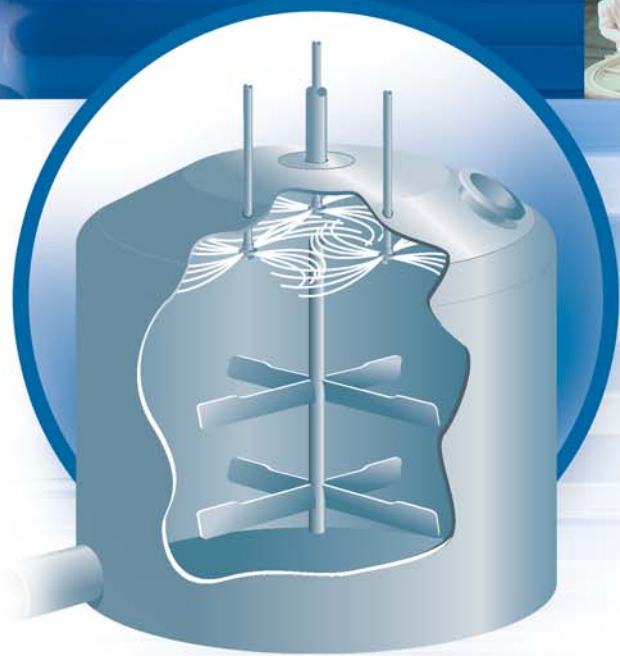
**For specifications, performance data or questions about your unique application, contact your local sales engineer at 1-800-95-SPRAY.**

## Low-maintenance Tablet Coating

The biggest challenges in tablet coating are caused by the highly-viscous nature of the coatings. Bearding, for example, is the buildup of dried coating on the nozzle, and it causes many tablet coaters to shut down their operation for cleaning as often as every 10 minutes — a time consuming and expensive production delay. Spraying Systems Co. has engineered several innovative technologies that have allowed our customers to run up to 32 times longer without shutting down for maintenance. Our spray products for tablet coating feature:

- Increased control of drop size and spray pattern
- Setups that reduce nozzle bearding
- Sanitary connections that meet FDA requirements
- Smooth, self-draining surfaces that are easy to clean
- Lightweight materials that are easier to maneuver in and out of the coater

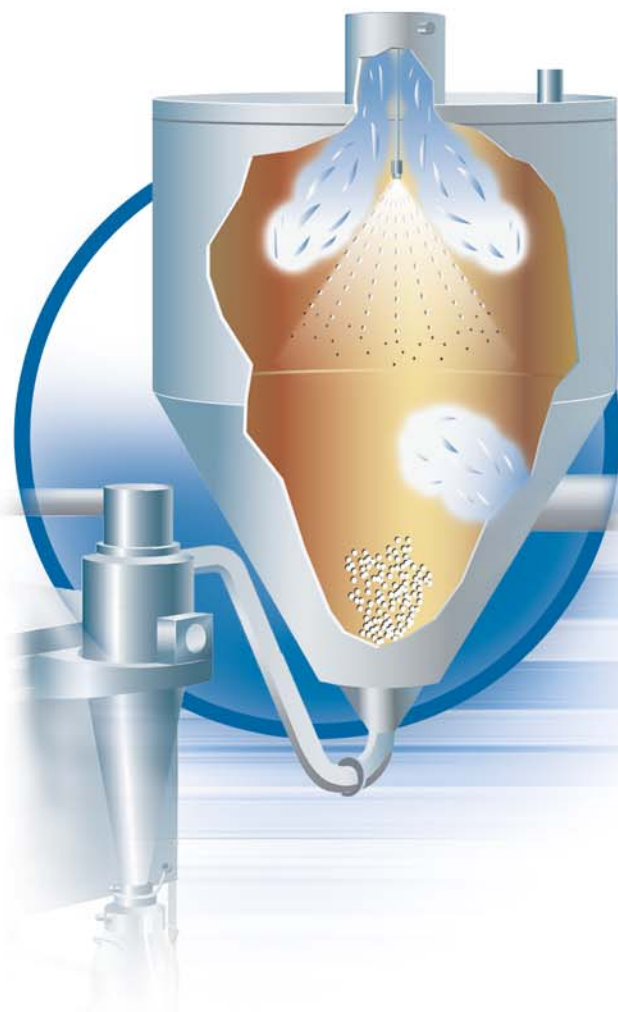




## Reliable Tank Washing

To maintain product integrity and avoid cross-contamination, FDA validation protocol for tank washing provides guidelines for duration and frequency of cleaning cycles, impact, cleaning chemicals and liquid temperatures. All of these factors are better controlled, more reliable and more repeatable with automated tank cleaning. By decreasing production downtime and labor costs, automated tank cleaning or CIP systems can save up to \$50,000 per tank annually compared to costs for manual cleaning. Our spray products for tank cleaning feature:

- A variety of flow rates and pressures to achieve the required impact
- Durable materials that withstand harsh cleaning chemicals
- Sanitary, threadless pin connections
- Rotating and fixed designs



## Uniform Spray Drying

Atomization, the process of generating drops, is the most critical step in the spray drying process. Final powder structure and quality can be compromised if drop size isn't precisely controlled and uniformly delivered. Very big or very small drops adversely affect the particle and result in incomplete or over-drying. Product can build-up on nozzles and dryer walls, causing frequent maintenance, dangerous hot spots and potential batch contamination. Our SprayDry® nozzles feature:

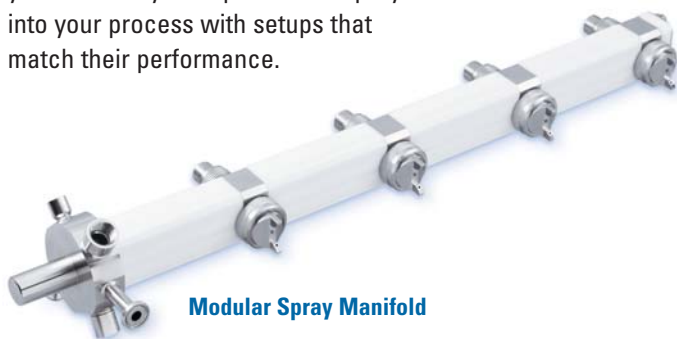
- Uniform drop size distribution
- Anti-Bearding caps with a recessed tip to reduce build-up
- Broad choice of drop sizes controlled by the nozzle's capacity and pressure
- Increased passages that resist clogging
- Sanitary design to facilitate FDA compliance



## Spray Nozzles and Manifolds for **Tablet Coating**

### **Decrease maintenance downtime with an easy-to-clean spray header**

The Modular Spray Manifold conceals liquid and air tubes inside FDA-compliant, chemical-resistant mounting blocks, greatly reducing the number of exposed tubes and fittings to connect and clean. It weighs 50% less than comparable manifolds so it's easier to remove from the coater, and it can be disassembled in less than a minute for quick clean-up. The manifold is available with anti-bearding spray nozzles to significantly reduce coating build-up on the nozzle orifice. If you are currently using 1/4JAU or 1/4VMAU spray nozzles, you can easily incorporate the Spray Manifold into your process with setups that match their performance.



**Modular Spray Manifold**

### **Reduce tablet defects with increased coating control**

VMAU Variable Spray Nozzles feature independent control of liquid, atomizing air and fan air, which allows you to fine-tune spray capacity, droplet size and spray patterns in your tablet coating application. Improved control of the highly-viscous coatings reduces quality problems like uneven coating, sticking and logo in-filling. Designed for FDA compliance, the sanitary body style contains no internal threads in the liquid chamber, and the optional diaphragm actuator decreases seal failure that typically results from spraying harsh coating materials. The modular body is designed for quick and easy maintenance without tools.



**VMAU Variable Spray Nozzle**

### **Run tablet coaters up to 32 times longer with Anti-Bearding setups**

Anti-Bearding Setups redirect air currents and prevent dried coating from clogging the air cap. They can save hundreds of thousands of dollars annually in labor costs for maintenance, wasted product, and the value of production downtime. With a wide variety of configurations available, you can easily replace your existing air atomizing setups with little to no change in spray performance characteristics. Anti-Bearding setups are compatible with 1/4JAU, VAU and VMAU spray nozzles.



**Anti-Bearding Setups**

### **Reduce costly coating consumption**

The 1/4JAU is an air actuated air atomizing nozzle that uses compressed air along with a pressurized or siphoned liquid to produce a wide variety of spray patterns and drop sizes. An internal air cylinder controls on/off operation up to 180 cycles per minute. The fast, pulsed spray reduces overspray and consumption of costly coatings. Model 7310-1/4JAU has a knurled head screw control to permit manual nozzle shut-off without disturbing operation of other nozzles on a manifold.



**1/4JAU**



## Spray Nozzles and Custom Lances for Tank Cleaning

### Sanitary features meet 3A CIP standards

With sanitary pin connections and self-draining surfaces, the 28500R tank wash nozzle, meets 3A standards for clean-in-place applications. Rotational velocity varies with fluid pressure. The 41800E tank wash nozzle also meets 3A standards for CIP but maintains constant rotational speed. Both are excellent for rinsing and cleaning medium-sized tanks.



Fluid-driven Nozzles

### Reduce water and chemical use with high-impact cleaning

The AA190 Tank Washer uses two to four high-pressure, solid-stream nozzles rotating on a motor-driven gear hub to aggressively clean stubborn residues from tanks up to 80 ft. in diameter.



AA190 Tank Washer

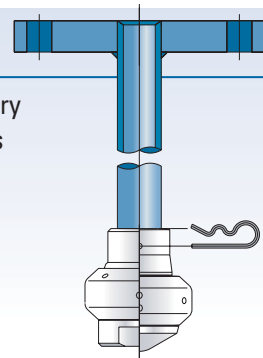
Fixed Spray Balls are commonly used in CIP systems because they have no moving parts and require minimal maintenance. Due to their low impact and ability to withstand harsh chemicals, they are best-suited for final rinse or sanitation applications.



Fixed Spray Balls

### Custom Lances

For complete tank wash and spray dry assemblies, we can fabricate lances to meet your exact specifications. Customize lance diameter, thickness and length, connectors, materials of construction and more.



## Spray Nozzles for Spray Drying

### Gain complete control of particle size and consistency

The flexible design of our SprayDry® nozzles allows you to interchange orifice insert/core combinations to configure a nozzle that meets your exact particle size requirements. The nozzles create a hollow cone spray pattern with superior drop size distribution. SKH-MFP and SBH-MFP models feature a clog-resistant maximum free passage and hand-tight cap that requires no-tools for maintenance. To meet sanitary regulations in the pharmaceutical industry, they have self-draining exterior surfaces, straight knurls and a smooth exterior finish.



SKH-MFP



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