A GUIDE TO SPRAY TECHNOLOGY FOR FOOD PROCESSING

SOLUTIONS FOR COATING, CLEANING, DRYING, FOOD SAFETY & MORE

Spraying Systems Co.
Experts in Spray Technology
Spray technology is used in dozens of operations in a food processing plant including cleaning tanks, equipment and areas of the plant; applying coatings, flavorings and other ingredients; packaging; spray drying and more. Optimizing spray performance can have a significant impact on the bottom line. Slashing water use, reducing waste of costly coatings and chemicals, minimizing manual labor and decreasing the risk of contamination are just a few of the benefits processors can experience by optimizing spray performance.

WE ARE UNIQUELY QUALIFIED TO HELP YOU IMPROVE QUALITY, INCREASE SAFETY & LOWER OPERATING COSTS:

- More than seven decades of experience with food processors focusing on cleaning, sanitizing, coating, cooling, drying, moisturizing, humidification and lubrication operations. Spray technology is our sole focus, resulting in an unmatched level of expertise
- Largest product line in the industry. Spray nozzles, spray manifolds and automated systems in food-grade compliant materials
- Research and testing capabilities ensure even the most challenging operations are optimized. Think your coating can’t be sprayed? Stubborn residues in vats and tanks taking too long to clean? We’ll use advanced modeling and testing to validate our suggested spray solution
- No charge on-site evaluations by our sales engineers can help identify areas for process improvements. Interested in reducing water or compressed air use? Looking for ways to minimize manual labor in coating and cleaning operations? Challenged by excessive maintenance due to over-application of costly ingredients and coatings? Give us a call, there’s a local sales office in your area
- Our global technical sales and manufacturing ensure you can implement the same solution in all of your plants to guarantee product quality and standardized production. We’re where you need us to be and ready to deliver

Learn more: 1.800.95.SPRAY | 1.630.665.5000 | spray.com
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AUTOJET® ANTIMICROBIAL SPRAY SYSTEMS

AutoJet Antimicrobial Spray Systems apply a predetermined volume of antimicrobial agent onto each product or into each package. The efficacy of this technology has been established by the USDA/ARS and the system has been used successfully with several commercially-available topical antimicrobials. Some processors have eliminated the need for lactates, diacetates and other internal antimicrobials entirely with the AutoJet Antimicrobial Spray System.

SYSTEM COMPONENTS

- Spray controller ensures precise application of antimicrobials and easy programming of different shot sizes and timing intervals for automatic batch changes
- PulsaJet® automatic spray nozzles with FDA-compliant finishes
- Fluid delivery device – pressure pot
- Optional auto-refill/ratio panel to continuously monitor the fluid level in the pressure tank and trigger refill cycles when needed

BENEFITS

- More cost-effective than other post-pasteurization techniques
- Controls use of costly antimicrobials
- Unattended operation
- Easily integrated into existing HACCP plans

IDEAL FOR:

- Bagged whole muscle products
- Hot dogs, links and formed products
- Fresh meats – subprimals and trim
- Packaged poultry products
- Sliced meat and poultry products
AUTOJET® MOLD INHIBITOR SPRAY SYSTEMS

AutoJet Mold Inhibitor Spray Systems apply mold inhibitors and antimicrobials to baked goods, snack foods and other food products. The system applies the mold inhibitor uniformly and provides complete coverage of the product to help extend product shelf life.

Danisco®, a world leader in food ingredients and enzymes, has determined that the AutoJet Mold Inhibitor Spray System provides the best application performance of Natamax® B on baked goods after baking or depanning.

SYSTEM COMPONENTS

• An AutoJet spray controller ensures accurate, intermittent spraying even if line speed varies
• Hydraulic PulsaJet® automatic spray nozzles
• Fluid delivery tank with pump
• Optional conveyor provides proper separation of product for accurate spray

BENEFITS

• Cost-effective – high efficiency at low concentrations over wide pH range
• Controls use of costly mold inhibitors
• Unattended operation
• Various recipes can be pre-programmed
• Automatic tank refill

IDEAL FOR:

• Loaf bread
• Tortillas
• English muffins
• Flat bread
There’s a TankJet product solution for nearly every tote, tank, vat or vessel. Options include tank cleaning nozzles, spray balls and high-impact tank cleaning machines. A few of the more-widely used products in food plants are featured here but there are dozens more. Visit tankjet.com for more information.

**TankJet 360 for tanks up to 100’ (30 m) in diameter** – this powerful, fluid-driven machine offers the most consistent impact over the entire pressure range. High-impact cleaning removes even the most stubborn residues efficiently and effectively so tanks can be returned to service quickly.

**TankJet AA190 for tanks up to 34’ (10 m) in diameter** – motorized unit operates at pressures up to 1000 psi (69 bar) and provides high-impact cleaning with 360° coverage. Motors are positioned outside of the tank for long, dependable wear life. Units can be permanently installed or moved from tank to tank.

**TankJet 63225-3A spray balls for tanks up to 13’ (4 m) in diameter** – stationary spray balls designed for sanitary rinsing are threadless, self-draining and have a polished 32Ra interior and exterior surface finish.

**TankJet lances** for efficient fluid delivery to tank cleaners – connections, lengths and materials are user-specified.

**BENEFITS**
- Thorough, consistent, quick cleaning of tanks
- Improves worker safety – eliminates need to enter tanks and minimizes exposure to hazardous chemicals
- Reduces use of costly cleaning chemicals and water

**IDEAL FOR:**
- Rinsing, cleaning and sanitizing tanks of all sizes
- Clean-in-place (CIP) and sanitary applications
GUNJET® SPRAY GUNS & CONVEYOR CLEANING NOZZLES

Improve cleaning efficiency without compromising quality. We have a wide range of solutions to help shorten cleaning time, sanitize hard-to-reach areas, reduce use of costly chemicals and more.

CU150A GUNJET SPRAY GUNS


BENEFITS

• Clean without spreading contaminants
• Conserve water and chemicals
• Durable and reliable – all stainless steel with white corrosion-resistant outer cover designed for food plants
• Ergonomic design reduces operator fatigue

CONVEYOR & EQUIPMENT CLEANING NOZZLES

VeeJet® flat spray nozzles are typically used for rinsing, cleaning and sanitizing conveyors because of the uniform coverage provided by overlapping spray patterns. Conventional and QuickJet® quick-connect styles are available in a wide range of spray angles, capacities and materials.

BENEFITS

• Eliminate manual cleaning and ensure cleaning consistency
• Clean conveyors thoroughly – high-impact flat spray nozzles with narrow angle sprays remove tough residues
• Reduce downtime with quick-connect nozzles which allow spray tips to be changed by hand

IDEAL FOR:

• General plant and equipment clean-up and sanitation
• Conveyor cleaning
• Equipment cleaning
COATING NOZZLES & SPRAY CONTROL

For precision application of ingredients, flavorings, butter, oils, release agents and other coatings, you’ll find a solution in our extensive product line. Choose from a wide range of hydraulic and air atomizing nozzles, threaded and sanitary connections, food contact approved materials, spray angles, capacities and more to ensure uniform coverage with minimal waste – even when applying viscous coatings.

PULSAJET® AUTOMATIC SPRAY NOZZLES

PulsaJet electrically-actuated spray nozzles are extremely versatile and ideal for coating with a wide range of non-viscous and viscous coatings. For high viscosity coatings like butter, oil, glaze and chocolate, recirculating and/or temperature controlled versions are available.

BENEFITS
- Consistent spray performance through automatic flow rate adjustment based on line speed*
- Reduced downtime and lower spray system costs – a single nozzle provides a wide range of flow rates*
- Extra low flow hydraulic atomizing eliminates the need for compressed air in many processes
- Excellent spray pattern integrity ensures uniform distribution across a conveyor
- Minimal waste and mess due to high transfer efficiency
- Increase production – cycle speeds up to 18,000 cycles to keep pace with fast line speeds
- Performance matched to your application – choose from several styles and dozens of spray tips

*See section on Precision Spray Control.

VMAU AUTOMATIC SPRAY NOZZLES

VMAU automatic spray nozzles allow easy adjustment of flow rate, drop size and spray pattern for maximum operating flexibility. Spray performance can be matched to your exact requirements – liquid flow rate, atomizing air and fan air pressure can be fine-tuned to meet application requirements or accommodate batch changes.

BENEFITS
- More uniform, consistent spray patterns than other air atomizing nozzles due to unique design features
- Suitable for viscous coatings – optional heat jacket keeps coatings flowing through nozzles
- Fast and easy maintenance – no tools required
- Suitable for use in a wide range of operations – dozens of standard and anti-bearding spray set-ups, threaded and sanitary connections
- Use with an AutoJet® spray controller for maximum control and performance optimization
AUTOMATIC AIR
ATOMIZING NOZZLES

Our air-actuated air atomizing nozzles are ideally suited for coating and moistening where precision is important. Choose from dozens of set-ups, body styles and spray patterns.

BENEFITS
• Internal air cylinder provides controlled on/off operation up to 180 cycles per minute
• Optional clean-out needles minimize clogging
• Compact versions ideal for use in production area with limited space
• Use with an AutoJet® spray controller for maximum control and performance optimization

IDEAL FOR:
- Butter
- Flavorings
- Mold inhibitors
- Oil
- Release agents on equipment
- Seasonings
- Sugar slurry
- Water

COATING/INGREDIENT
APPLICATION

PRECISION SPRAY CONTROL
OVERVIEW

Precision spray control is achieved by turning electrically-actuated spray nozzles on and off very quickly to control flow rate. This cycling is so fast that the flow often appears to be constant.

Benefits include:
• Flow rate can be automatically adjusted to line speed to ensure proper application
• A single nozzle can produce a wide range of flow rates. Pressure remains constant, so spray angle and drop size are unaffected by flow rate changes
• Very low flow rates can be achieved without using compressed air to atomize the spray
• Precision spray control requires PulsaJet® nozzles and an AutoJet spray controller
AUTOJET® MODEL 1550+
MODULAR SPRAY SYSTEM

For basic control of automatic spray nozzles, this compact, easy-to-use system is ideal. It can be used with electrically- and pneumatically-actuated spray nozzles to control air and liquid.

BENEFITS

• Accurate placement of the sprayed liquid through precise on/off control
• Even application of the sprayed liquid through automated liquid and air control
• Precision spray control when used with PulsaJet® spray nozzles
• Easy set-up, operation and integration

AUTOJET SPRAY CONTROLLERS

Additional spray controllers are available with more advanced control features such as automatic adjustments to spray system components based on operating conditions, automatic detection of clogged nozzles, operator notification on specified faults and more.

IS YOUR COATING OR MATERIAL SPRAYABLE?

The answer to this question is, almost always, yes. We have a long history of using spray technology to apply just about every coating, ingredient, slurry, flavoring, topping, and sealant. The best way to determine if your coating or material is sprayable is with a proof-of-concept test in our spray laboratories.

Here’s a partial list of coatings being successfully applied with spray technology:

- Cheese
- Chocolate
- Cinnamon
- Egg wash
- Fat barriers
- Gravy
- Marshmallow cream
- Moisture barriers
- Sugar slurry
- Wax

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SPRAY MANIFOLDS

Spray manifolds play an important role in many coating operations by optimizing nozzle performance. Manifolds ensure proper fluid and air flow to nozzles and nozzle placement/positioning to eliminate quality problems. Spray manifolds also can reduce downtime by simplifying changeover between batches. Spray manifolds are available for use with a wide range of nozzles and are configured to meet application requirements.

• **63600 sanitary PulsaJet® spray manifolds** – constructed of 316L stainless steel, this jacketed manifold is designed for use with up to 18 hydraulic PulsaJet automatic spray nozzles. Nozzle spacing is user-specified. The jacket can be used for heating or cooling.

• **63600 sanitary air atomizing spray manifolds** – same design as the 63600 sanitary PulsaJet spray manifold, this version is for use with 1/4J or 1/4 VMAU series air atomizing nozzles. A wide range of spray set-ups and versions with shut-off and clean-out needles ensures you get the performance you need.

**BENEFITS**

• Ensures proper delivery of fluid and air to nozzles
• Speeds installation and maintenance

**IDEAL FOR:**

• Spraying release agents
• Applying coatings to products in pans, drums or on conveyors
• Viscous coatings requiring heating or cooling
ACCUCOAT® HEATED SPRAY SYSTEMS

AccuCoat Heated Spray Systems eliminate the problems associated with traditional viscous coating methods like enrobing and manual ladling systems. These automated systems provide precise temperature control from the tank to the target to eliminate waste caused by coatings that are too hot or too cold. Processors using AccuCoat systems report significant increases in production, improvements in product quality and lower operating costs.

• **AccuCoat Heated System for conveyor-based operations** – this fully jacketed system uses closed-loop temperature control and automated system adjustments based on line speed to ensure coating uniformity and consistency. A bench-top version is available for use in an R&D environment.

• **AccuCoat Pan Spraying System** – up to six-times faster than manual ladling systems and two- to three-times faster than other automated systems, this compact system can be equipped with one or two nozzles or easily expanded to a fully centralized pan coating system.

**BENEFITS**

• Increase production

• Reduce waste – misting and over-application of coatings are eliminated

• Improve food safety – worker contact with product is eliminated

• Minimize downtime – multiple recipes can be pre-programmed to facilitate batch changes

**IDEAL FOR:**

- Butter
- Chocolate
- Fat barriers
- Oil
- Sugar slurry

• Coating candies, nuts, cereals and other confectioneries with viscous coatings in pans
You will find the perfect match to your performance requirements in our product line – it’s the most extensive in the industry. You’ll find different nozzle styles – swirlchamber, core and whirlchamber designs. Each style has multiple configuration options and hundreds of interchangeable components.

- **SV SprayDry nozzles with swirlchamber design** – these nozzles are direct replacements for competitive nozzles but that’s where the similarity ends. SV SprayDry nozzles provide longer wear life, higher standard rated pressures and competitive pricing and are readily available – shipping in days, not weeks.

- **SK and SB SprayDry nozzles with core design** – these nozzles feature a very narrow, uniform drop size distribution to ensure particle size consistency. In addition, drop size can be fine-tuned by adjusting capacity and pressure. Maximum free passage and anti-bearding styles are available to reduce clogging and minimize build-up on the nozzle face.

- **WhirlJet® SprayDry nozzles** – for use in high volume operations. WhirlJet SprayDry nozzles produce larger particles and provide uniform drop size distribution with minimal product waste at pressures up to 5000 psi (340 bar). Choose from two body styles and two types of whirlchambers.

**BENEFITS**

- Extend production runs due to use of superior materials of construction
- Reduce maintenance time – hand-tight design on most models eliminates the need for special tools and simplifies disassembly and reassembly
- Versatile – hundreds of interchangeable swirlchambers, insert/core and insert/whirlchamber combinations ensure you’ll get the performance you need

**IDEAL FOR:**

- Coffee
- Flavorings
- Food color
- Infant formula
- Ingredients
- Milk
- Nutraceuticals
- Powdered foods and drinks
- Tea
- Whey
- Yeast
WINDJET® AIR PRODUCTS FOR DRYING/BLOW-OFF

For superior drying or blow-off, you’ll find what you need in our WindJet line. Some products use compressed air and others use clean heated air from a regenerative blower. All of our WindJet solutions will help you dry parts more thoroughly and quickly, improve precision in blow-off operations and reduce compressed air use or eliminate it completely.

- **WindJet air knife packages** – Air knives powered by use of an energy-efficient air source – a dependable, low maintenance regenerative blower – are ideal where air velocity is needed for drying. A uniform, high volume air stream along the entire length of the knife is produced to eliminate spotting and blotching problems. Air cannons can be used instead of or in conjunction with air knives and provide a targeted air stream that can be directed into holes and indentations for complete drying.

- **WindJet air nozzles** – Convert a low volume of compressed air into a targeted, high-impact air stream for complete drying with WindJet air nozzles. Available in a wide range of styles, spray patterns and capacities, WindJet nozzles are also widely used for cooling, blow-off and moving products on/off conveyors.

**BENEFITS**

- Reduce operating costs up to 95% – WindJet air knife packages eliminate the need for compressed air; WindJet air nozzles use up to 92% less compressed air than open pipe
- Low operating noise
- Improve worker safety

**IDEAL FOR:**

- Drying cans and bottles
- Drying conveyors
- Blowing rejected product from conveyor lines
- Cooling baked goods
- Dust blow off
- Moving product from conveyor to conveyor
SEALING/PROTECTIVE FINISH NOZZLES

Protecting packages from scuffs and scratches prior to shipping is often accomplished by spraying chemical coatings directly on jars, bottles, cans and other containers. Spray nozzles are also commonly used in labeling operations to apply adhesives on plastic, metal and glass packages. We have a variety of products to help ensure sealants are applied uniformly with minimal waste.

- **PulsaJet® automatic spray nozzles** are widely used to coat bottles and jars with scuff-resistant coatings. The electrically-actuated nozzles are cycled on and off at a controlled frequency to maintain coating weight despite line speed changes.

- **Can coating nozzles** feature a patented design that was developed in conjunction with leading beverage can producers. These nozzles apply an asymmetrical spray distribution that efficiently coats two-piece aluminum can surfaces using a minimal amount of coating material.

**BENEFITS**
- Lower operating costs by reducing use of coating material
- Improve packaging quality and lower scrap

**IDEAL FOR:**
- Adhesives
- Chemical coating
- Glue
- Wax
### VISIT SPRAY.COM AND TANKJET.COM TO LEARN MORE

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