



A GUIDE TO SPRAY TECHNOLOGY FOR BAKERIES

SOLUTIONS FOR COATING,
SCORING, PAN LUBRICATION,
CLEANING & MORE



Spraying Systems Co.[®]
Experts in Spray Technology





INCREASE PRODUCTION, IMPROVE QUALITY & LOWER OPERATING COSTS WITH SPRAY TECHNOLOGY

Spray technology is used in dozens of bakery operations. Applying coatings (like glazes, butter and mold inhibitors), lubricating pans, scoring bread and equipment can be challenging. Optimizing spray performance can have a significant impact on the bottom line in your bakery by eliminating waste of costly ingredients, ensuring uniform coverage in coating operations, automating manual tasks and more.

WE'RE UNIQUELY QUALIFIED TO HELP:

- More than seven decades of experience with bakeries focusing on coating, lubrication and cleaning 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? We'll help find the best solution using sophisticated test equipment in our spray labs
- No charge on-site evaluations by our sales engineers can help identify areas for process improvements
- 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





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THE SECRET TO UNIFORM COATING, MOISTURIZING & SCORING: PRECISION SPRAY CONTROL

Applying ingredients, flavorings, coatings, moisture, mold inhibitors, release agents and bread scoring can be challenging. In order to achieve uniform coating and precise scoring, processors have often tolerated waste, scrap, misting and excessive maintenance downtime. Now there is a way to eliminate all those problems. AutoJet Precision Spray Control Systems provide unmatched accuracy in coating and scoring operations.

Challenging Coatings We've Conquered

We have a proven track record of using spray technology to apply just about every coating, ingredient, slurry, flavoring and topping. Here's just a partial list:

- | | | | |
|-----------------|-------------------|-----------------------------|-----------------------------------|
| • Butter | • Enzymes | • Lecithin | • Peanut butter |
| • Caramel | • Fat | • Lubricants/release agents | • Shortening |
| • Cinnamon | • Food-grade dyes | • Milk | • Slurries – starch, sugar, yeast |
| • Eggs/egg wash | • Gels | • Mold inhibitors | • Water |
| • Emulsions | • Glazes/syrup | • Oils | |



ACHIEVE SUPERIOR COATING PERFORMANCE

Superior coating in bakeries requires precise control of liquid flow to ensure that costly coatings are applied only where and when they are needed. Precisely controlling the coating temperature is also critical when applying challenging coatings such as glazes or chocolate. Together, our flow and temperature control technologies ensure that quality and production are optimized.

AutoJet® Precision Spray Control Systems consist of PulsaJet® automatic spray nozzles and an AutoJet spray controller. These systems ensure coatings are applied uniformly and with minimal waste even when line speed changes. Precision Spray Control (PSC) ensures that flow rate changes based on line speed occur almost instantaneously to maintain the proper application rate.

PSC also enables a single PulsaJet nozzle to produce a wide range of flow rates. Electrically-actuated hydraulic versions can achieve very low flow rates – comparable to the flow rates of air atomizing nozzles. Using hydraulic nozzles eliminates the need for costly compressed air and minimizes the misting and overspray problems often associated with air atomizing nozzles.



AccuCoat® Spray Systems eliminate the problems often associated with applying coatings such as oils, glazes, release agents and other viscous coatings. Precise heating of viscous coatings ensure that the solution is at the ideal temperature for spraying but not too hot to burn or impact product quality. Cooling of coatings such as egg wash is also possible.

BENEFITS OF TEMPERATURE CONTROL

- Reduce waste – clogging, misting and over-application of viscous coatings are eliminated
- Eliminates product loss caused by uneven coating
- Minimize downtime required for clean-up

HOW PRECISION SPRAY CONTROL WORKS

Electrically-actuated spray nozzles are turned on and off very quickly to control flow rate. This cycling is so fast that the flow often appears to be constant.

With traditional nozzles, flow rate adjustments require a change in pressure. Changing pressure also changes the nozzle's spray angle/coverage and drop size. With PSC, pressure remains constant enabling flow rate changes without changes in spray performance.

Nozzles spraying 90% of the time



Nozzles spraying 50% of the time



Nozzles spraying 25% of the time



BENEFITS OF PRECISION SPRAY CONTROL:

- Reduces product scrap caused by over- or under-application of coatings and imprecise scoring
- Reduces the use of costly coatings by applying the proper coating volume directly on the target
- Eliminates maintenance time to clean excess coating from equipment and floors due to overspray
- Improves work environment by minimizing misting
- Increases flexibility by using a single nozzle with a wide flow rate range for different products or line speeds
- Eliminates the need for compressed air in some coating operations

SEE THE BENEFITS OF PSC:
spray.com/psc



UNMATCHED COATING & SCORING SYSTEM VERSATILITY



PulsaJet® nozzles and an AutoJet® spray controllers are used to optimize performance for most coating systems. Many systems include a spray manifold as well to ensure proper fluid delivery. A wide range of nozzle, controller and manifold options are available so performance can be tailored to the specifics of the operation and desired level of automation.

Contact your local sales engineer for system selection assistance and a no-obligation demonstration.

PULSAJET NOZZLES:

- Threaded or sanitary connections
- Standard, recirculating and temperature control designs
- Hydraulic and air atomizing versions
- Available with premium auto-align flat spray tips

SPRAY MANIFOLDS:

- **98250 spray manifold** for use with hydraulic PulsaJet spray nozzles
- **63600 heated and non-heated manifolds** for use with hydraulic and air atomizing PulsaJet nozzles

AUTOJET® SPRAY CONTROLLERS:

- **AutoJet Model 1550+ Modular Spray System** with basic on/off spray control for up to eight PulsaJet nozzles
- **AutoJet Model 2008+ Spray Control Panel** provides timing and sensor control for up to 16 PulsaJet nozzles
- **AutoJet Model 2250+ Spray Control Panel** with sophisticated real-time monitoring and closed-loop control for up to 16 PulsaJet nozzles



AUTOJET® PRECISION SPRAY CONTROL SYSTEMS: TYPICAL APPLICATIONS IN BAKERIES

- Spraying oil, butter and flavorings on dough prior to baking to improve taste and appearance
- Applying release agents to pans and conveyors to prevent products from sticking
- Adding viscous coatings like glazes, sugar slurries, cinnamon and frostings to breakfast foods, snacks and desserts
- Coating products with preservatives and mold inhibitors to extend shelf life
- Applying moisture to products to help ingredient adhesion
- Adding water to foods to balance moisture loss from freezing
- Applying a precise coating of oil to maintain a consistent calorie count
- Scoring bread

ACHIEVING RESULTS WITH AUTOJET® PRECISION SPRAY CONTROL SYSTEMS

AUTOJET BREAD SCORING SYSTEM

SCRAP AND MAINTENANCE TIME REDUCED BY 20%

Problem: A mechanical splitter scoring rolls prior to baking frequently stuck to unbaked dough. The bakery found the scrap rate unacceptably high. In addition, the splitter required frequent maintenance and reduced production time.

Solution: An AutoJet Bread Scoring System now precisely scores the rolls. Pans of rolls on conveyors pass under the spray manifold. PulsaJet® nozzles produce a needle-like spray and provide clean score marks even when conveyor line speed changes.

RESULTS:

System payback:
less than eight months

Lower scrap rate:
20% reduction in
rejected rolls

**Reduced maintenance
time:** 20% reduction
in downtime enabled
a boost in production

AUTOJET EGG WASH SYSTEM

GLAZE USE DECREASED BY 60%

Problem: A bakery glazing brioche with egg yolk substitute was challenged by high glaze use and misting. The bakery wanted to reduce the consumption of the glaze and improve the cleanliness of the production environment.

Solution: An AutoJet Egg Wash System now applies the proper volume of egg yolk substitute even when line speed changes. Misting has been eliminated by using hydraulic PulsaJet nozzles. In addition, the system provides precise temperature control of the egg wash and reduced maintenance downtime.

RESULTS:

System payback:
less than one year

Reduced use of glaze:
0.5 oz. (15 g) per tray –
down from 1.2 oz. (35 g)
per tray

Improved quality: more
uniform spray distribution
has improved the
appearance of the brioche

AUTOJET GLAZE/SYRUP APPLICATION SYSTEM

AUTOMATED SPRAY SYSTEM ELIMINATES COSTLY QC PROBLEM

Problem: Damaged cakes and customer complaints prompted this bakery to find a way to ensure cakes remain firmly affixed to cardboard plates during shipping. Coating the cake plate with heated corn syrup proved to be the solution. However, the syrup was often overheated and had to be discarded. In addition, workers were routinely over-applying the syrup creating costly waste and a messy work environment.

Solution: An AutoJet Syrup Application System with temperature control now applies a precise volume of corn syrup to each plate. As the plates move down the conveyor, a PulsaJet nozzle applies a light coating of corn syrup on each plate. An AutoJet spray controller ensures the timing of the intermittent spray is accurate.

RESULTS:

System payback:
less than three months

Lower scrap rate:
cake damage dropped
by 90%

**Reduced use of
corn syrup:** 50% lower
consumption

Lower operating costs:
workers have been
deployed to other tasks

AUTOJET MOISTENING SYSTEM PRODUCTION SPEED INCREASE FIVE-FOLD

Problem: Geary's Bakeries, one of Britain's best known craft bakeries, needed to ensure that seed toppings would consistently adhere to rolls. Applying too much water caused the seeds to sprout and too little water resulted in seeds falling off. Geary's was having workers dip each dough ball in water and then pressing it into seeds – a slow and tedious process.

Solution: An AutoJet Moistening System now applies a precise volume of water to the rolls. An AutoJet Model 1550+ Modular Spray System automatically adjusts the flow rate for variations in line speed. Operators can easily set the duration of the spray cycle based on the type of baked good and the delay time between the detection of the baking tray and beginning of the spray cycle.

RESULTS:

System payback:
less than three months

Seed application:
time reduced from
5 seconds per roll
to 1 second per roll

**Improved product
quality:** seed adhesion
problems eliminated

AUTOJET MOLD INHIBITOR SPRAY SYSTEM SHELF LIFE EXTENDED BY SEVEN DAYS

Problem: A bakery applying a preservative to bread products prior to packaging faced two problems caused by inconsistent application. When too little preservative was applied, shelf life suffered. When too much preservative was applied, taste was negatively affected and product returns skyrocketed.

Solution: The preservative is now applied precisely with an AutoJet Mold Inhibitor Spray System. The system automatically adjusts the application rate based on line speed to ensure the proper volume is applied. In addition, the application rate can be easily adjusted to accommodate various bread products.

RESULTS:

Increased shelf life:
average increase
of 7 days

Reduced returns:
customer returns have
decreased by 60%

**Eliminated
over-application:**
preservative use has
decreased significantly
for a savings of
US\$19,000 annually

AUTOJET PAN LUBRICATION SYSTEM SAVINGS OF US\$25,000 ANNUALLY ON PAN COATING

Problem: An artisan bakery was manually applying a release agent on pans prior to baking to prevent bread from sticking. The process was messy, wasteful and time-consuming. The bakery was paying a premium for the release agent in aerosol cans.

Solution: The pans are now sprayed by an AutoJet Pan Spray System. Pans are loaded on a conveyor. When the pans pass under the spray station, a sensor detects the pans to trigger the sprays. In addition, the volume of release agent spray can be adjusted easily to accommodate different pan sizes.

RESULTS:

System payback:
less than four months

Production increase:
pans are coated
five times faster

Reduced waste:
release agent overspray
eliminated for monthly
savings of US\$2,100

Lower operating costs:
workers have been
deployed to other tasks



TANKJET® TANK CLEANING EQUIPMENT FOR MIXERS, BLENDERS & VATS

There's a TankJet product solution for nearly every dough mixer, vat and container in your bakery. Options include tank cleaning nozzles, spray balls and high-impact tank cleaning machines. A few of the more-widely used products in bakeries are featured here but there are dozens more.

Visit tankjet.com for more information.



- **TankJet 360 for mixers 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 sticky residues efficiently and effectively so mixers can be returned to service quickly. (Shown upper left.)
- **TankJet 78 for tanks up to 45' (14 m) in diameter** – fluid-driven unit with controlled rotational speed provides powerful solid streams and full 360° coverage. Sanitary design complies with the 3-A Sanitary Standard 78-01, Spray Cleaning Devices Intended to Remain in Place. The unit is self-draining and can be disassembled and reassembled in minutes – without tools. (Shown upper right.)
- **TankJet AA190 for mixing vats 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 vat for long, dependable wear life. Units can be permanently installed or moved from vat to vat. (Not shown.)

- **TankJet 63225-3A spray balls for containers 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. (Shown lower left.)
- Other sanitary nozzle options include the TankJet 27500R for cleaning tanks up to 25' (7.6 m) in dia. and the TankJet D41800E for high impact cleaning of tanks up to 12' (3.6 m) in dia. (Shown lower middle and lower right.)

BENEFITS

- Thorough, consistent, quick cleaning of mixers and vats
- Improves worker safety – eliminates the need to enter tanks and minimizes exposure to hazardous chemicals
- Reduces use of costly cleaning chemicals and water
- Facilitates process validation for food safety

IDEAL FOR:

- Rinsing, cleaning and sanitizing mixers, vats and containers of all sizes
- Clean-in-place (CIP) and sanitary applications

The 3A symbol is a registered trademark of 3-A Sanitary Standards, Inc.

CLEANING EQUIPMENT FOR CONVEYORS & PRODUCTION AREAS

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

High-impact, low-pressure CU150A GunJet spray guns offer versatile performance. Guns feature an adjustable spray pattern – from hollow cone to solid stream – and interchangeable orifice caps for quick and easy change of spray capacity.

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 and equipment cleaning

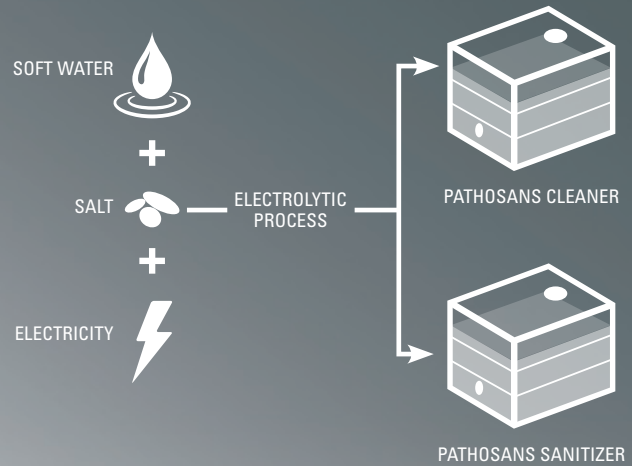


PATHOSANS® SYSTEM PRODUCES POWERFUL CLEANING & SANITIZING SOLUTIONS ON-DEMAND IN YOUR BAKERY

Change the way you clean with the PathoSans system. It's safer, better for the environment and less costly than using traditional chemicals. Plus, the PathoSans system produces a cleaner and sanitizer that are just as effective as those you're using now and no changes to your standard operating procedures are required.

HOW IT WORKS

- PathoSans's patented electro-chemical activation technology convert salt, water and electricity into a sodium hydroxide cleaner and hypochlorous acid sanitizer. The solutions are produced on-site, on-demand in ready-to-use concentrations
- The solutions remove sticky residues and biofilms just as well as, if not better than, traditional chemicals
- PathoSans solutions are salt-free and safe for use on stainless steel



BENEFITS

- Flexible solutions – clean and sanitize everything in your facility including trays, pans, conveyors, floors and common areas. Can also be used in your CIP/COP systems
- Improved worker productivity – fewer health problems due to exposure to concentrated toxic chemicals; more time can be spent on cleaning and less time getting in and out of safety gear
- Drain and disposal safe
- Cost-effective – potential for savings compared to the use of traditional chemicals



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