PulsaJet® Automatic Spray Nozzles

Unmatched Precision for the Most Demanding Coating, Sealing and Marking Operations
Advanced Spray Technology
Delivers Superior Performance

The PulsJet® family of automatic spray nozzles provides accurate spray placement and excellent spray pattern integrity with a wide range of design options, including:

- Speeds up to 10,000 cycles per minute or more with AutoJet® spray controllers.
- Hydraulic or air atomizing spray tips, including selected quick-connect tips.
- Flow rates up to 15.8 gpm (59.8 l/min).
- Fluid pressures up to 350 psi (24 bar).

To fully optimize the performance of PulsJet nozzles, AutoJet spray controllers are recommended to maximize cycle speed, utilize Pulse Width Modulated (PWM) flow control, validate spray operation and implement other advanced control methods.

Your sales engineer can help you evaluate the various control options and choose the solution that will best meet your application requirements.

In the following pages, you’ll learn more about:

- How PulsJet nozzles and AutoJet spray controllers can help you improve quality, increase production time, minimize waste and reduce maintenance time.
- Why PulsJet automatic nozzles are quickly becoming the preferred solution in high-precision spray applications.
- How PulsJet nozzles are helping manufacturers improve their productivity.

Typical Applications

Coating & Moistening

- Adding flavorings and preservatives to food products.
- Coating bottles to minimize scuffing on bottling lines and in transit.
- Applying antimicrobial agents on meat and poultry products.
- Adding fragrances to paper products.
- Spraying egg coating on baked goods prior to baking.
- Moistening particleboard to improve board quality and increase throughput.
- Adding water to frozen foods to balance moisture loss in freezer.

Marking

- Nail line marking on roof shingles and other building materials.

Lubricating & Adhesive Spray

- Applying die lube and mold release for metal and plastic parts.
- Lubricating steel strip prior to forming.
- Spraying release agent on screens and drums in wood building panel manufacturing.
- Applying adhesive to packaging materials to prevent slippage on pallets.
- Applying adhesive on tire treads.
Here’s How PulsaJet® Automatic Spray Nozzles Can Improve Your Productivity

**Increased productivity**
High speed cycling – up to 10,000 cycles per minute or more – means faster line speeds and a boost in throughput.

**Eliminate waste of costly fluids**
Accurate spray placement and exceptional spray pattern integrity ensure the sprayed solution is delivered to the target with minimal waste.

**More flexibility without having to change spray tips**
PulsaJet nozzles provide a wide range of flow rates from a single spray tip. Downtime for tip changeout and overall nozzle expense can be reduced.

**Reduced maintenance time caused by clogged tips**
PulsaJet nozzles operate at low flow rates using clog-resistant larger spray tips.

**Improved worker safety**
Reducing or eliminating misting and overspray greatly improves the work environment.

**Smooth integration to most work environments**
A compact design enables nozzles to be added to most production areas without costly reconfiguration.

**Choice of hydraulic or air atomizing versions**
Hydraulic PulsaJet nozzles can often be used to reduce misting in many applications that previously required air atomizing nozzles.

**Improved and automated quality control**
Add SprayCheck® sensors to PulsaJet nozzles for real-time spray verification. If spraying doesn’t occur, costly quality problems can be quickly avoided.

**Faster routine maintenance**
Wear parts are easily accessible to minimize maintenance time.

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**How Pulse Width Modulated (PWM) Flow Control Improves Performance:**

PWM flow control involves switching electrically-actuated PulsaJet spray nozzles on and off very quickly using an AutoJet® spray controller. For a duty cycle of 50%, the nozzle sprays half the time and the flow will be 50% of the flow rate for that nozzle at a given pressure. This cycling takes place so quickly that the flow often appears to be constant and the coverage remains reasonably uniform. Controlling flow rate by adjusting duty cycle and frequency provides distinct advantages over controlling flow by adjusting pressure.

**With PWM Flow Control:**
- Flow rate can be changed almost instantaneously.
- Extremely high flow turndown ratios can be achieved at a single pressure.
- Drop size and spray angle remain constant. Coverage is more consistent and uniform over a wide range of flow rates.
- Relatively low flow rates can be generated without clogging enabling hydraulic PulsaJet nozzles to replace air atomizing nozzles in many applications.
- Misting is minimized.
- Chemical consumption can be reduced.
AutoJet Spray Controllers with Onboard Software Deliver Key Performance Advantages

- Maximum cycle speeds and advanced timing control ensure even coverage without waste.
- Precise control of liquid and atomizing air pressure provides consistent flow rate, spray angle and drop size.
- Pulse Width Modulated (PWM) flow control enables flow rate to be adjusted at a fixed pressure.
- New 2008 PWM Control Panel can increase speed up to 18,000 cycles per minute or can triple the operating pressure.
- Real-time performance monitoring with alarm activation or automatic shutdown on selected faults.
- Intelligent fault messages improve troubleshooting should spray performance degrade.
- Easy integration with other plant control systems.

Optimize PulsaJet® Nozzle Performance with AutoJet® Spray Control

Problem-Solving with PulsaJet Automatic Spray Nozzles

Precise Application of Antimicrobials Results in Multiple Log Reduction

A processor of ham and hot dog products wanted to increase production and reduce chemical use without compromising product safety. An AutoJet Antimicrobial Spray System with PulsaJet nozzles provided the necessary performance and enabled the processor to eliminate slower, more expensive post-pasteurization techniques.

A predetermined volume of lauric arginate is applied into packages or onto meat before sealing. Vacuum-sealing of the packages distributes the antimicrobial evenly around the product. An AutoJet spray controller and a SprayCheck® sensor monitor liquid pressure and flow to the nozzles to ensure the proper volume of antimicrobial is delivered to each product. The result? A multiple log reduction and lower operating costs.

Uniform Spraying of Release Agent Improves Board Quality, Lowers Costs

A particleboard manufacturer wanted to eliminate product scrap and the use of costly compressed air. Hydraulic PulsaJet nozzles using PWM flow control and an AutoJet controller helped achieve these goals and more.

PWM flow control enables the use of very low flow rates and eliminates the need for air atomizing nozzles. PulsaJet nozzles precisely apply a release agent on boards to prevent damage caused by belt sticking and eliminate variations in board thickness. Closed-loop system control ensures even coverage despite significant changes in line speed, resulting in better board quality and increased throughput.
Problem-Solving with PulsaJet Automatic Spray Nozzles

Beverage Bottles Look Better and Last Longer Using Less Coating Material

PulsaJet nozzles and an AutoJet spray controller provided a more efficient solution for a specialty chemical producer that previously applied their anti-scuff coatings on beverage bottles with sponges.

The nozzles are cycled very quickly at a controlled frequency to maintain coating weight despite changes in line speed. As a bottle enters the spray station, a photo eye sensor detects its presence and triggers the spray cycle. The AutoJet controller monitors the fluid pressure and sounds an alarm if spray coverage is compromised.

Coating material is now applied more evenly and bottle life is extended dramatically.

Variable Flow Rate and Precise Volume Control Critical

A metal door manufacturer was seeking a way to apply water to act as a catalyst for an adhesive in its assembly operation. The volume of water applied is critical and is dependent on a variety of changing operating conditions. In addition, line speeds varied significantly requiring application rate adjustment.

Speed and proximity sensors along with PulsaJet nozzles and an AutoJet controller met all requirements. A precise volume of water catalyst is applied no matter the production speed of the line. Using PWM flow control, extremely high turndown ratios are achieved for the PulsaJet nozzle. Precise and reliable spray control reduced the scrap rate and resulted in a payback period of three months.

Beverage Bottles Look Better and Last Longer Using Less Coating Material

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Add SprayCheck® Monitoring for Performance Verification and Quality Improvement

The SprayCheck monitoring system is ideal for use in selected spray applications. Here’s how it works:

- A miniature sensor, mounted near the orifice of a PulsaJet® nozzle, optically detects a spray pattern emerging from the spray tip.
- Each “spray” signal sent by an AutoJet® spray controller is confirmed with a “spray present” signal from the SprayCheck sensor.
- Unconfirmed spray cycles can activate alarms or stop production.
- Each spray cycle can be documented and logged by the controller.

Spraying Systems Co.
<table>
<thead>
<tr>
<th>Model</th>
<th>Nozzle Type</th>
<th>Capacity</th>
<th>Speed Cycles per min</th>
<th>Max Flow Rate at Max Pressure gpm/psi</th>
<th>Amps at 24VDC</th>
<th>Tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA(B)10000AUH−03</td>
<td>Hydraulic</td>
<td>Up to -03</td>
<td>10,000</td>
<td>0.47 gpm at 100 psi (1.80 l/min at 7 bar)</td>
<td>0.36</td>
<td>UniJet® TPU tips</td>
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<tr>
<td>AA(B)10000AUH−03−QC</td>
<td>Hydraulic</td>
<td>Up to -03</td>
<td>10,000</td>
<td>0.47 gpm at 100 psi (1.80 l/min at 7 bar)</td>
<td>0.36</td>
<td>QuickJet® QSVV tips</td>
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<tr>
<td>AA(B)10000AUH−10</td>
<td>Hydraulic</td>
<td>-03 to -10</td>
<td>5,000</td>
<td>1.60 gpm at 100 psi (6.10 l/min at 7 bar)</td>
<td>1.05</td>
<td>UniJet TPU tips</td>
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<tr>
<td>AA(B)10000AUH−10−HP</td>
<td>Hydraulic</td>
<td>up to -10</td>
<td>1,000</td>
<td>Up to -08: 2.40 gpm at 350 psi (9.10 l/min at 24 bar)</td>
<td>2.00</td>
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<td></td>
<td></td>
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<td>-10: 2.50 gpm at 250 psi (9.4 l/min at 17 bar)</td>
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<tr>
<td>AA(B)10000AUH−30</td>
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<td>2,500</td>
<td>4.7 gpm at 100 psi (17.80 l/min at 7 bar)</td>
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<td>1,000</td>
<td>15.80 gpm at 100 psi (59.80 l/min at 7 bar)</td>
<td>4.00</td>
<td>QuickJet QUA tips</td>
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<tr>
<td>AA(B)10000JJAU−VI</td>
<td>Air Atomizing</td>
<td>Up to 2850</td>
<td>10,000</td>
<td>0.16 gpm at 100 psi (0.61 l/min at 7 bar)</td>
<td>0.36</td>
<td>JJ air atomizing set-ups</td>
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NPT and BSPT connections are available. The addition of (B) to the part number indicates a BSPT connection is required.
Selecting the Right PulsaJet® Spray Nozzle for Your Operation

Choose from a wide range of capacities, speeds, hydraulic or air atomizing setups, spray tips and connection types. All PulsaJet nozzles are CE certified.

**PulsaJet Nozzle Technical Specifications**

- Mounting on the front, sides or back with #8-32 UNC or M4 threaded screws.
- Includes 16’ (5 m) long cable; 3-pole, female M8 threaded style; electrical connector is constructed of nickel-plated brass except for AA(B)10000AUH-100-QC, which uses a DIN Form A female cord set.
- Wetted parts are constructed of stainless steel, Ryton® and PEEK™ for maximum chemical resistance; seals are Viton®.

### Model Nozzle

<table>
<thead>
<tr>
<th>Weight (oz)</th>
<th>Max Fluid Temp F° (°C)</th>
<th>Inlet Conn.</th>
<th>Physical Dimensions in (mm)</th>
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<tr>
<td></td>
<td></td>
<td>1/8 NPT or BSPT</td>
<td>OL</td>
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<tr>
<td>9 (0.26)</td>
<td>200 (93.3)</td>
<td></td>
<td>2.62 (66.5)</td>
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<tr>
<td>10 (0.28)</td>
<td>200 (93.3)</td>
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<td>2.94 (74.7)</td>
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<tr>
<td>21 (0.60)</td>
<td>150 (65.6)</td>
<td></td>
<td>3.50 (88.9)</td>
</tr>
<tr>
<td>38 (1.08)</td>
<td>100 (37.8)</td>
<td></td>
<td>3.91 (99.2)</td>
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<tr>
<td>38 (1.08)</td>
<td>100 (37.8)</td>
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<td>3.91 (99.2)</td>
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<tr>
<td>56 (1.60)</td>
<td>100 (37.8)</td>
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<td>5.21 (132.4)</td>
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<tr>
<td>10 (0.28)</td>
<td>200 (93.3)</td>
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<td>2.70 (68.5)</td>
</tr>
</tbody>
</table>

* NPT and BSPT connections are available. The addition of (B) to the part number indicates a BSPT connection is required.
Other Helpful Resources

A Guide to Pulse Width Modulated Flow Control
Technical Manual 414

Explains how PWM flow control works. The advantages of controlling flow rate by adjusting duty cycle and cycling speed of electric nozzles while maintaining a constant pressure are discussed and application examples are included.

A Guide to Spray Technology for Food Processing
Bulletin No. 524

Informative guide summarizes the latest spray technologies for coating, spray drying, cooling, humidifying and packaging.

AutoJet® Model 1550 Modular Spray System
Bulletin No. 626

Describes our simple, self-contained system that provides exceptional spray control with dependable results.

Optimizing Your Spray System: Spray Nozzle Maintenance and Control for Improved Production Efficiency
Technical Manual 410

Explains how to maximize performance and quality in your spray application.

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Viton® is a registered trademark of DuPont Performance Elastomers.