



BETE[®]

PERFORMANCE SPRAY ENGINEERING

AUTOMATED SYSTEMS FOR PRECISION SPRAY APPLICATIONS

INDUSTRIAL COATING, MOISTENING,
AND LUBRICATING SOLUTIONS



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EXCEEDING EXPECTATIONS

BETE'S MISSION GOES BEYOND JUST SELLING SPRAY NOZZLES. IT IS TO PROVIDE ENGINEERED SPRAY PROCESS SOLUTIONS THAT EXCEED CUSTOMER EXPECTATIONS IN EVERY DETAIL.

Our patented spray technologies are quality inspected and field-proven to meet the high standards of third-party certifiers.

We manufacture tens of thousands of different products, including fog and misting nozzles, tank washing nozzles, material injection nozzles, custom spray lances, fabrications, and spraying systems.

THE MOST RESPONSIVE CUSTOMER SERVICE AND APPLICATIONS ENGINEERING IN THE INDUSTRY

Our experience working in dozens of industries and enhancing thousands of applications translates to expert engineering you can count on when it matters most. **Expect world-class customer service from project inception through the delivery of your final product.**

From initial discussions to design, fabrication and ongoing service – **we will make your project a success.**



Spray Nozzles



Spray Fabrications



Spray Systems



Applications Engineering



Spray Research

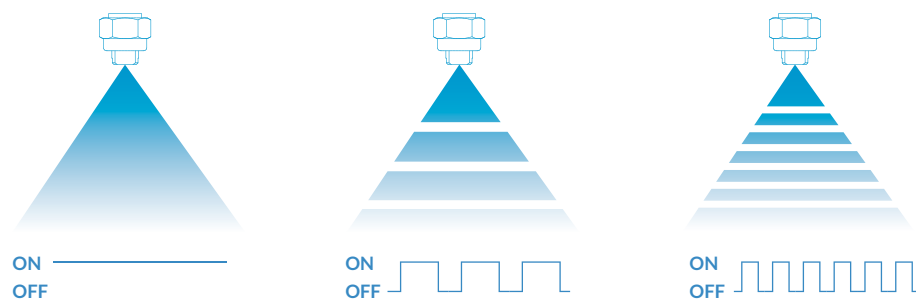
THE ADVANTAGES OF PRECISION SPRAY AUTOMATION

SPRAY THE EXACT AMOUNT THAT YOU NEED,
PRECISELY WHEN YOU NEED IT.

With the FlexFlow™ series precision spray control systems, spray zones are activated by automatic triggers such as photoelectric or proximity sensors, or manually. Adjustable trigger delay settings provide ultimate timing control to reduce material waste and cleaning maintenance.

ACHIEVE UNIFORM COATING WITH PULSE WIDTH MODULATION

FlexFlow™ spray controllers provide even finer spray precision by regulating spray flow rate using Pulse Width Modulation (PWM). With traditional single fluid spray nozzles, the only way to adjust flow rate is by adjusting liquid supply pressure. This results in changes to spray performance characteristics such as drop size and spray pattern. By comparison, PWM flow control works by cycling spray nozzles on and off at high frequencies, up to 150 times per second. Adjusting the duty cycle, or ratio of ON versus OFF dwell time, enables FlexFlow to control the average flow rate without changing the supply pressure or spray performance characteristics. High frequency operation ensures that spray coverage remains uniform, even when coating products on high speed conveyors.



PRECISION SPRAY CONTROL FLEXIBILITY

BETE's automatic spray nozzles offer a thoughtfully engineered selection of options to pair with our FlexFlow™ control panels. These systems are intuitive, accessible, and affordable – with desirable standard features included to streamline your precision spray automation implementation.

Complete your installation with our skilled team of custom fabricators to create the ideal header, spray bar, or manifold for your unique industrial spray process.

AUTOMATIC PRECISION SPRAY NOZZLES

Available in a variety of configurations and spray patterns including hydraulic or air atomized sprays. All nozzles feature compact designs. Select nozzles include recirculation of sprayed liquid capabilities.

• HYDROPULSE® SPRAY NOZZLES - ELECTRIC

- Hygienic Food-Grade Design
- Industrial Economy Option

• HYDROPULSE® SPRAY NOZZLES - PNEUMATIC

- XA AIR ATOMIZING SPRAY NOZZLES
- SAM AIR ATOMIZING SPRAY NOZZLES

CUSTOM SPRAY FABRICATIONS

• SPRAY BARS & MANIFOLDS

- Achieve uniform spray coverage across wide areas
- Common for conveyor coating applications
- Optimize liquid/air flow and nozzle placement

• SPRAY HEADERS

- Multiple nozzle arrangements
- Common for spray tower or area distribution
- Branched or ring designs

FLEXFLOW™ PRECISION SPRAY CONTROLLERS

• FLEXFLOW 1000 SPRAY CONTROLLER

Program two zones of unique precision spray control with up to six nozzles in each zone – or synchronize up to twelve nozzles.

• FLEXFLOW 2000 PREMIUM SPRAY CONTROLLER

Provides ultimate system flexibility by managing up to 20 spray nozzles in up to 20 independently controlled spray zones. Auto-adjust duty cycle to match conveyor speed in each zone.

SEE DETAILED SPECIFICATIONS ON PAGES 5-11



BETE® FLEXFLOW™ PRECISION SPRAY CONTROL SYSTEMS FOR AUTOMATIC SPRAY NOZZLES

BETE's FlexFlow Spray Systems ensure precision control and flexible automation for our Electric HydroPulse® and other automatic spray nozzles. These plug-and-play controllers are an elegant solution for precision coating, moistening, and lubricating applications. Consider the FlexFlow for any industrial process where expensive compounds or ingredients need to be sprayed directly onto the process target. Each control panel can be used as a standalone system – or upgrade to the 2000 model to integrate with your existing plant operations. Discover optimal spray performance for applying flavorings, coatings, mold inhibitors, antimicrobials, preservatives, release agents, and moisturizers with exceptional accuracy.



FLEXFLOW™ 1000

- HMI touch screen includes intuitive operations for streamlined control and diagnostic overview for troubleshooting
- Operate up to 12 nozzles
- Two zones of precision control
 - Operate up to 6 nozzles in each zone
 - Zones 1 and 2 can be programmed with independent or synchronous settings



FLEXFLOW™ 2000

The FlexFlow 2000 offers ultimate system flexibility by managing up to 20 spray nozzles in up to 20 independently controlled spray zones. With individual spray zone assignment for each nozzle, you can group nozzles into as many zones as needed to accomplish your spray process objectives.

- HMI touch screen includes intuitive operations for streamlined control and diagnostic overview for troubleshooting
- Match spray volume to conveyor speed with auto-adjust duty cycle
- Extremely flexible in zone operations – can operate up to 20 nozzles with up to 20 triggers in up to 20 zones
- Ethernet port for process integration
- Three versions available with an easy upgrade path:
 - V1 Operates up to 10 Nozzles
 - V2 Operates up to 16 Nozzles
 - V3 Operates up to 20 Nozzles



FOOD PROCESSING BENEFITS

- Control a wide range of flow rates
- Guarantee an even and uniform application rate that connects with conveyor line for automated speed adjustments
- Reduce consumption of expensive coatings
- Reduce overspray waste and improve product quality
- Exact target coatings secure a clean and safe environment
- Promote increased production
- Reduce maintenance and downtime
- Reliable spray dosing provides an accurate calorie count

USE AS A PRECISION SPRAY SYSTEM FOR A WIDE VARIETY OF FOOD PROCESS COATING OPERATIONS:

- Application of antimicrobial agents for food safety
- Application of preservatives and mold inhibitors to help extend shelf life
- Application of egg wash
- Coat bottles to minimize scuff damage
- Apply water to balance moisture loss from the freezing process
- Apply coatings and release agents to pans, cookie sheets, and conveyors to prevent sticking
- Apply flavorings, oil, and butter to enhance the appearance and improve the taste of products
- Apply viscous coatings like syrups, glazes, and chocolate

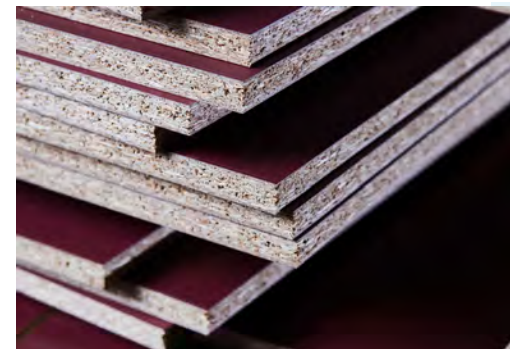
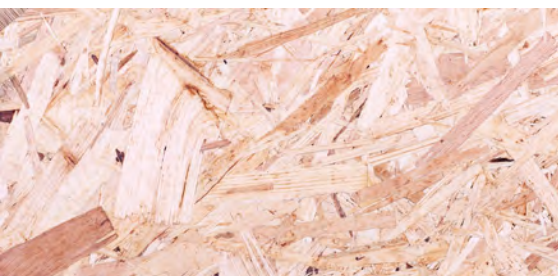
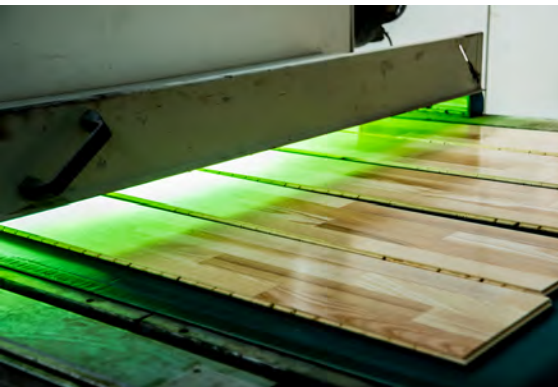
ENGINEERED WOOD PRODUCTION BENEFITS

BETE's FlexFlow™ Spray Systems provide solution confidence for precise applications of resin, wax, water, and release agents during engineered wood production. Addresses problems involving overspray or under-spray to ensure production efficiency for chips, mats, cauls, or belts.

- Ensure precise application and reduce waste
- Integrate tonnage or line speed to maintain uniform coverage when variables change
- Reduce the use of expensive resins, waxes, or release agents by applying the exact volume required
- Apply the optimal amount of surface moisture to increase production by decreasing time in the press
- Confidently transition to running full polymeric MDI products with non-stick press protection
- Eliminate compressed air from most pre-press and wax operations

USE AS A PRECISION SPRAY SYSTEM FOR A WIDE VARIETY OF ENGINEERED WOOD PRODUCTION OPERATIONS:

- Apply PMDI or LPF resin in the blender
- Apply slack wax, tallow wax or e-wax in the blender
- Add surface moisture before pressing boards
- Apply mixed release agent on mats, cauls, or press belts when using PMDI resins
- Mark nail lines on oriented strand board (OSB)



BETE® HYDROPULSE® AUTOMATIC SPRAY NOZZLES FOR PRECISION FOOD PROCESSING & INDUSTRIAL APPLICATIONS

BENEFITS

- Precision volume sprays directly on the target
- Reduced waste and minimal overspray maintain a clean, safe environment
- Uniform coverage
- Each nozzle produces a wide range of flow rates

ELECTRIC HYDROPULSE® AUTOMATIC SPRAY NOZZLES

BETE's electric-actuated HydroPulse Spray Nozzles assure precision volumes of expensive ingredients and compounds are sprayed directly onto your processing target, with overspray waste virtually eliminated. Pair with the BETE® FlexFlow™ Precision Spray Control System to achieve uniform coverage, even if you adjust your conveyor speed.

Electric HydroPulse (EHP) spray nozzles do not require a compressed air source and are capable of cycling on/off up to 150 cycles per second. These features afford the option of using high-frequency cycling known as Pulse Width Modulation (PWM) to vary the liquid spray flow rate at constant supply pressure with little change in spray performance by adjusting the duty cycle. When the spray cycles at a high enough frequency, coverage uniformity is maintained because the duration between pulses of spray is short enough to ensure there are no gaps in the spray coverage.



HYDROPULSE® - ELECTRIC - FOOD GRADE HYGIENIC DESIGN

Liquid inlet connection	1/8", NPT or BSPT; or 1/2" tri-clamp
Maximum liquid flow rate	1.0 GPM
Maximum rated pressure	250 PSI
Thermal insulation class	F (155°C/311°F)
Power	9.4W @ 24VDC
Maximum cycle frequency	150 cycles/sec
Nozzle construction	Stainless steel wetted components, Food grade Viton® (FKM) seals compliant with CFR 21.1700.2600, hygienic design
Interchangeable BJ, BJH, and CW nozzle tip options.	



HYDROPULSE® - ELECTRIC - INDUSTRIAL DESIGN

Liquid inlet connection	1/8", NPT or BSPT
Maximum liquid flow rate	1.0 GPM
Maximum rated pressure	300 PSI
Thermal insulation class	F (155°C/311°F)
Power	10.4W @ 24VDC
Maximum cycle frequency	50 cycles/sec
Nozzle construction	Stainless steel wetted components, Viton® (FKM) seals
Interchangeable BJ, BJH, and CW nozzle tip options.	



HYDROPULSE® - PNEUMATIC

Provides a controlled intermittent liquid spray using only liquid pressure as the force for atomization. Offers drip-free performance. Pneumatically actuated for crisp on/off precision spray performance.

Liquid inlet connection	1/4" NPT or BSPT, liquid; 1/8" NPT or BSPT, cylinder air
Maximum flow rate	5.3 GPM
Maximum rated liquid pressure	600 PSI
Operating temperature range	-15°F to 400°F
Air cylinder pressure	30 PSI to 250 PSI
Maximum cycle frequency	3 cycles/sec
Nozzle construction	Stainless steel wetted components, Viton® (FKM) seals
Interchangeable BJ, BJH, CW, and ST nozzle tip options.	



BETE® AIR ATOMIZING AUTOMATIC NOZZLES FOR PRECISION SPRAY APPLICATIONS

Air atomizing nozzles use the energy in compressed air or gas to produce finely atomized liquid sprays at relatively low operating pressures.

- If you have low pressure and a smaller drop size is needed that cannot be achieved with a single fluid nozzle, an air atomizing nozzle is the perfect choice.
- When a viscous fluid needs to be sprayed/atomized that cannot be sprayed with a single fluid nozzle, an air atomizing design is the best option.

XA 10 & 11 LOW FLOW AIR ATOMIZING SPRAY NOZZLES

The XA nozzle system has many interchangeable components that can be assembled to achieve a variety of air atomizing spraying objectives, with a choice of internal or external mix set-ups. For more information on the XA nozzle series components and options, please visit www.bete.com/products/xa-dir.



Liquid inlet connection	1/8" or 1/4" NPT or BSPT, liquid and air
Maximum liquid flow rate	72 GPH
Maximum rated liquid pressure	40 PSI
Operating temperature range	-15°F to 400°F
Air cylinder pressure	30 PSI to 250 PSI
Maximum cycle frequency	3 cycles/sec
Nozzle construction	Nickel plated brass or stainless steel wetted components, Blue-Gard® gasket, Viton® (FKM) seals
Compatible with XAAD, XAEF (pictured), XAER, XAFF, XAPF, XAPR, XASF, XASR, and XAXW spray set-ups.	

SAM EXTERNAL MIX AIR ATOMIZING SPRAY NOZZLES

Design Features of the SAM Flat Fan and Narrow Round Automatic Nozzle

- Separate atomizing and fan air lines provide variable coverage and fine control of drop size without affecting liquid flow rates. Higher atomizing air pressure yields finer drop size; higher fan air pressure yields broader patterns.
- Removable plug provided for liquid recirculation port
- External mix; allows spraying of viscous materials
- Liquid flow rates are independent of air
- Precise metering of the liquid flow rate
- Pneumatically-controlled shut-off and clean-out built in



Inlet connections	1/8" NPT or BSPT; air and liquid
Maximum liquid flow rate	47 GPH
Maximum rated liquid pressure	20 PSI
Operating temperature range	15°F to 400°F
Air cylinder pressure	30 PSI to 250 PSI
Maximum cycle frequency	3 cycles/sec
Nozzle Construction	Stainless steel wetted components, Blue-Gard® gasket, Viton® (FKM) seals

CUSTOM SPRAY HEADERS & MANIFOLDS

Everything needed to scope, order, design and produce your custom spray fabrication – all under one roof. Our departments work seamlessly together to ensure the products you receive are of the highest quality. Achieve your optimal performance solution with engineering customized to your requirements.



SPRAY BARS & MANIFOLDS

- Uniform spray coverage across wide areas
- Common for conveyor coating
- Optimize liquid/air flow and nozzle placement



SPRAY HEADERS

- Multiple nozzle arrangements
- Common for spray tower or area distribution
- Branched or ring designs

QUALIFIED FOR THE TASK

- Working with BETE as your primary fabricator ensures all components are designed to fit and work together
- Reduced need for coordinating between multiple suppliers saves you time and hassle
- Non-Destructive Examination (NDE) Qualifications
 - PMI, PT, RT, UT, VT, Hydrostatic Testing, Hardness Testing
- As a world leader and innovator in the nozzle industry for over half a century, BETE provides personalized service and experience to guarantee solution confidence





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PERFORMANCE SPRAY ENGINEERING

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