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THE PRODUCTS YOU NEED AND PERFORMANCE YOU CAN COUNT ON

You'll find tens of thousands of hydraulic spray nozzles in this catalog but you can also visit **spray.com** to see tens of thousands more. Featured products include air atomizing nozzles, automatic hydraulic and pneumatic nozzles, handheld spray guns, tank cleaning equipment, air nozzles and nozzles for specialized operations like descaling, trim squirt, spray drying, fire protection and more. We offer nozzles in more sizes and materials than any other supplier, so you're sure to find a product that delivers the performance you need.

PRECISE, DEPENDABLE PRODUCT QUALITY

Your satisfaction is important to us. Our products are manufactured to exacting standards to deliver the promised performance each and every time you order. We are ISO 9001:2015 and 14001:2015 certified. Products ship only after undergoing our rigorous quality control and testing programs. If you have any concerns about the quality of any of our products, contact us immediately. We will address your issues and take corrective action as needed.

PRODUCTS WHEN YOU NEED THEM

Most of our spray nozzles are readily available and will be shipped within days of your order. If you need expedited service, let us know. Our twelve manufacturing locations are strategically located around the world to help ensure we can get our products where they are needed quickly and cost-effectively.

SPECIAL REQUIREMENTS? TELL US WHAT YOU NEED.

If one of our standard products isn't quite right for your equipment, just let us know. Customization can range from simple changes in materials to specially-designed nozzles to meet exacting performance requirements.

We work with hundreds of OEMs and provide services like these:

- Special nozzle designs
- Private labeling with unique part numbers
- Special packaging
- Customized maintenance and operating instructions



THE SERVICES YOU NEED, WHEN AND WHERE YOU NEED THEM

OUR SOLE FOCUS ON SPRAY TECHNOLOGY ENSURES RESULTS IN YOUR OPERATIONS

Since spray technology is all we do, we have a level of expertise that can't be matched. Our sales engineers are factory-trained and only sell our spray products. Need to increase throughput in a coating operation? Eliminate waste or lower scrap? Cool products more quickly? Suppress dust? Minimize water and chemical use in cleaning operations? Just give us a call. With sales offices on six continents and more than 90 sales offices, we are in your area and ready to help.

WHAT CUSTOMERS SAY ABOUT OUR SERVICE

"We are very pleased with Spraying Systems Co.
Wish all vendors were as good."

"Very pleased – awesome is the best way to describe
Spraying Systems Co. service."

"A+ on service. Sales engineer responded quickly
and visited my facility to review various product
options for my application."

"Rep always provides prompt answers. Knows
the full product line inside and out."

"I get more technical support from Spraying Systems Co.
than any other vendor."

"The local rep came right out – didn't even know
the size of the project at the time."

"Spraying Systems Co. provides solutions – not just parts."

"More knowledgeable than any other equipment
company we work with."

"We get the products we need, when we need them.
Each and every time we order."





ADDITIONAL EQUIPMENT TO OPTIMIZE SPRAY NOZZLE PERFORMANCE

SPRAY CONTROL

Spray nozzles can only perform properly if the entire spray system is operating efficiently. That's why we offer a wide range of AutoJet® spray controllers. Choose from basic automatic control, monitoring of spray variables or automatic adjustments of spray variables based on what is happening in your process. Adding a spray controller can help:

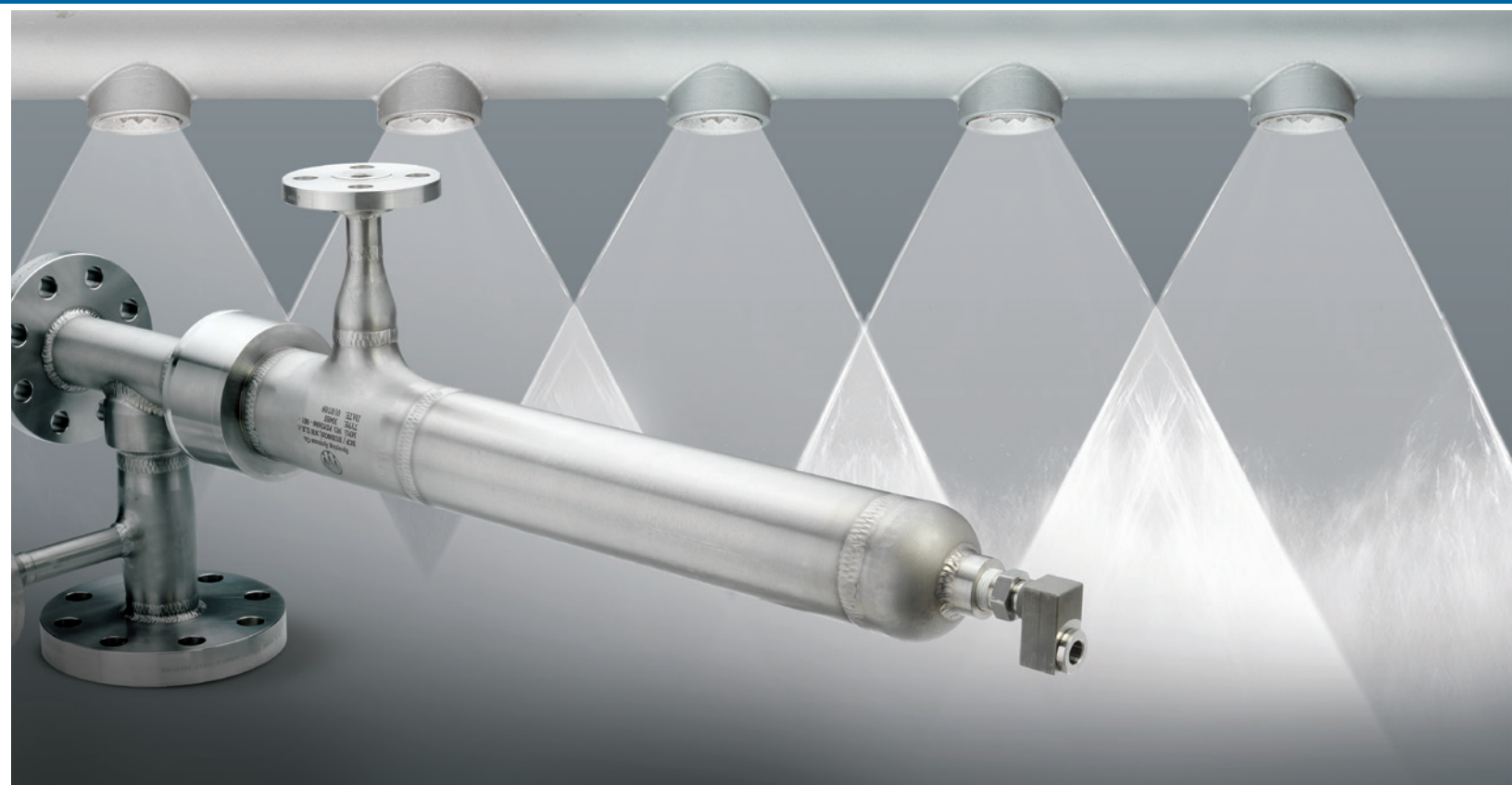
- Increase production through automation and enable operation at variable line speeds
- Reduce labor costs by eliminating manual operation, system monitoring and changeover of nozzles between batches
- Lower operating costs by eliminating overspray and waste through precision spraying
- Improve worker safety by minimizing exposure to harmful chemicals

Application-specific systems are also part of our offering for more demanding spray operations.

TURNKEY SYSTEM OPTIONS

- AccuCoat® Heated Spray Systems for viscous food coatings
- Precision Spray Control Systems for uniform coverage on the target and nowhere else – even when line speeds change
- AutoJet® Food Safety Systems for the application of antimicrobials and mold inhibitors
- PanelSpray® Systems for engineered wood products
- AutoJet Precision Lubrication Systems for oil application and mold release
- AutoJet Gas Cooling Systems for pollution control

Additional options include systems for dust suppression, NOx control and humidification. Check with your local sales office; system availability may vary by region.



HEADERS AND INJECTORS

The equipment that supplies fluid to spray nozzles can have a big impact on performance. If the fluid flow isn't adequate or the fluid delivery devices aren't suitable for the operating environment, the entire process is in jeopardy. Unlike feed devices built by fabricators or in-house staff, our spray headers, manifolds, showers, injectors, lances and quills are designed to optimize the performance of our spray nozzles and streamline your operations.

You can specify the length, number of nozzles, nozzle spacing and connection type for most of our manifolds and headers. Spray injectors can also be customized. You can specify nozzle type, nozzle placement, materials, coatings and any specialized testing required.

The next time you order spray nozzles, take a moment to consider your fluid delivery equipment. Talk to your local sales engineer about ways to ensure optimal performance and streamline operations.

PRODUCT OPTIONS INCLUDE:

- Basic spray nozzle manifolds with a C-channel to facilitate spray nozzle set-up and adjustment
- Pipe-in-pipe spray manifolds with nozzles mounted inside a slotted pipe for protection against build-up and damage
- Modular spray manifolds with easy-to-access tubing and fittings to simplify set-up and cleaning
- Built-to-order spray manifolds
- Automatic brush showers that keep nozzles clean without process interruption or maintenance downtime
- Built-to-order spray injectors for use in demanding environments such as refineries, power plants and chemical production
- Spray quills and lances for use in environments where spray performance is less critical



PERFORMANCE VALIDATION BEFORE YOU BUY

TESTING SERVICES HELP ENSURE PRECISION SPRAY PERFORMANCE

In new spray applications or applications where spray performance is critical, it is important to understand how factors like these affect performance:

- Operating conditions such as pressure, temperature and variable line speeds
- The liquid being sprayed
- The placement and position of nozzles in relation to the target

In many cases, experience and theoretical calculations can provide an indication of actual spray performance. However, testing in our spray labs determines actual performance and can eliminate costly specification mistakes or quality problems after installation. During testing, we can adjust operating conditions and/or test different nozzles until we find the exact spray performance required in your application.

Common tests include:

- | | |
|--------------------------|--------------------|
| • Spray characterization | • Spray angle |
| • Drop size distribution | • Evaporation rate |
| • Spray impact | • Residence time |
| • Spray pattern | • Dwell time |
| • Spray coverage | |

A LOOK INSIDE OUR LABS

Evaluating sprays requires very specialized equipment. In fact, some of our equipment was designed by our spray engineers and is used only in our facilities. Our test equipment includes:

- Spray patternators to measure spray distribution
- Impact testers to determine impact throughout a spray
- Laser diffraction and Phase Doppler particle size analyzers to measure drop size and spray velocity
- Laser sheet imaging analyzers to evaluate spray shape and distribution
- Wind tunnel to determine the effects of air currents and gas flows on sprays



ADVANCED MODELING SERVICES AND MANUFACTURING CAPABILITIES FOR COMPLEX AND DEMANDING APPLICATIONS

It is not feasible to replicate operating conditions for every application. Gas cooling, chemical injection, spray drying and tablet coating are just a few applications where we cannot spray the liquids used for safety reasons or procure comparable process equipment. Yet, in these applications, understanding spray performance is often critical to process efficiency, product quality, equipment longevity and even worker safety. That's when we use sophisticated modeling tools to predict spray performance.

- Computational Fluid Dynamics (CFD) models illustrate flow patterns, velocity, temperature, gas/liquid distributions, droplet trajectories, internal system pressure and more in scrubbers, towers, ducts and dryers. Our models use data we've collected in our spray labs to reduce the error factor and precisely predict spray performance
- Fluid Structure Interaction (FSI) examines the interaction between fluid dynamics and structural integrity. This enables us to determine the materials required to withstand mechanical stresses such as load, pressure, turbulence, corrosion and more

Demanding applications often require the use of special materials and compliance with various manufacturing codes and testing standards. We can produce nozzles, quills, injectors and headers to exacting standards and conduct a wide range of tests to validate construction.

MANUFACTURING AND TESTING CAPABILITIES

Manufacturing:

- ASME® Boiler and Pressure Vessel Code
- ASME B31.1 Power Piping Code
- ASME B31.3 Process Piping Code
- Welding to ASME B&PV Code Section IX
- cGMP
- Canadian Registration Number requirements

Testing in accordance with ANSI®, ASTM® standards:

- Ultrasonic
- Radiographic
- Liquid penetrant
- Hardness
- Hydrostatic
- Magnetic particle examination
- Positive material identification

See Trademark Registration and Ownership, page i-1.

Learn more about our testing and modeling services at sprayanalysis.com



HOW YOU CAN BENEFIT FROM SPRAY SYSTEM OPTIMIZATION

WAYS TO LEARN MORE

EXPERT ADVICE AT YOUR PLANT

Sustainability Assessments – Invite our team of experts to evaluate your cooling, coating, cleaning, drying, mixing or other operations. We will identify ways to:

- Reduce water, chemical and energy use
- Reduce scrap and waste
- Reduce risk and improve safety

Complimentary Lunch and Learn workshops –

Select a topic, choose a date and invite your colleagues. We'll provide lunch and an informative 60-minute session. Popular topics include *Spray Nozzle Basics*, *Understanding Drop Size* and *How to Reduce Use of Costly Chemicals*.

Spray demos and proof-of-concept trials at your facility –

Your local sales engineer will conduct demos and tests on-site so you can see how a product will work in your environment. When operating conditions don't allow an on-site demo or test, other arrangements can be made.

TESTS AND DEMONSTRATIONS AVAILABLE AT REGIONAL SPRAY TECHNOLOGY CENTERS

Throughout North America, we have several Spray Technology Centers. These facilities are equipped to conduct proof-of-concept tests and technology demonstrations. Seminars including live demonstrations on various topics are also conducted throughout the year. Schedules vary by region so contact your local sales engineer for information.

MULTI-DAY SEMINARS FOR ADVANCED LEARNING

An in-depth seminar on the atomization and spraying of liquids is conducted twice a year at our facility in Wheaton, IL. Attendees spend time in the classroom and our fully equipped spray laboratories and participate in spray characterization tests. More information is available from your local sales engineer and at sprayanalysis.com.





EDUCATIONAL RESOURCES

Video demonstrations and tutorials on spray.com and [YouTube.com/sprayingsystems](https://www.youtube.com/sprayingsystems)

Explore our video library and learn about new spray products and techniques; best practices in maintenance procedures; what to look for in a spray pattern and more.

Informational reference material on spray.com

- *Optimizing Your Spray System*, Technical Manual 410
- *Three Simple Ways to Dramatically Reduce Water Use*, White Paper 116
- *Dramatically Reduce Chemicals, Lubricants & Other Coatings Without Compromising Quality*, White Paper 117
- Plus a wide range of industry- and application-specific technical bulletins filled with selection, optimization and maintenance tips

Case studies on spray.com

More than 200 case studies demonstrate how processors have improved operating sustainability, increased production and lowered costs by optimizing cooling, coating, cleaning, lubricating, drying and other applications using our spray technology. See spray.com/results.

Catalogs on spray.com

- Air Atomizing and Automatic Air Atomizing Nozzles
- Hydraulic Nozzles
- TankJet® Tank Cleaning Products
- WindJet® Air Products
- SprayDry® Nozzles
- Spray Technology for Steelmaking
- Spray Technology for Pulp and Papermaking
- Car Wash Products
- GunJet® Handheld Spray Guns



SELECTION GUIDELINES

Use this general guide as a starting point if you're not sure which type of nozzle to use in your spray operation. However, keep in mind that performance varies based on operating conditions, so be sure to contact your local representative for assistance.

ABSORBER TOWERS

FullJet®, SpiralJet® and DistroJet® full cone nozzles	Section B
WhirlJet® hollow cone nozzles	Section D



AIR PRODUCTS

See spray.com for information on WindJet® compressed air and blower-powered air knife packages.



AIR WASH

FullJet and SpiralJet full cone nozzles	Section B
WhirlJet hollow cone nozzles	Section D



AIRLESS SPRAYING

See spray.com for information on automatic spray nozzles and tungsten carbide spray nozzles.



AUTOMATED SPRAYING

See spray.com for information on automatic spray nozzles, AutoJet® spray controllers and turnkey spray systems for precision coating, gas cooling, lubrication and more.



CLEANING: TANK

See tankjet.com for information on our full line of TankJet® tank cleaning equipment.



COATINGS AND ADDITIVES

Fine spray nozzles	Section E
VeeJet® flat spray nozzles	Section C
WhirlJet hollow cone nozzles	Section D

See spray.com for additional information on air atomizing nozzles, automatic spray nozzles and turnkey coating systems.



COOLING: IN PROCESS

FullJet and SpiralJet full cone nozzles	Section B
FloodJet® flat spray nozzles	Section C
WhirlJet hollow cone nozzles	Section D



COOLING: GAS

SpiralJet full cone nozzles	Section B
SpiralJet and WhirlJet hollow cone nozzles	Section D

See spray.com for additional information on two-fluid nozzles for gas cooling and turnkey gas cooling and pollution control systems.



DESCALING

See spray.com for information on descaling and other spray products for steelmaking.



DUST CONTROL

WhirlJet® hollow cone nozzles	Section D
SpiralJet® full cone nozzles	Section B
Fine spray nozzles	Section E



ETCHING AND RINSING

ProMax® Quick VeeJet and FloodJet® flat spray nozzles	Section C
FullJet® full cone nozzles	Section B



FIRE PROTECTION

SpiralJet and FullJet full cone nozzles	Section B
FloodJet flat spray nozzles	Section C



FOAM CONTROL

FloodJet flat spray nozzles	Section C
FullJet and SpiralJet full cone nozzles	Section B



HUMIDIFICATION

See spray.com for information on air atomizing and automatic spray nozzles.



SCRUBBERS: GAS CONDITIONING

See spray.com for information on two-fluid nozzles for gas cooling, spray injectors for gas conditioning and turnkey gas cooling and pollution control systems.



SCRUBBERS – WET

WhirlJet and SpiralJet hollow cone nozzles	Section D
FullJet and SpiralJet full cone nozzles	Section B



SPRAY DRYING

See spray.com for information on SprayDry® nozzles.



SPRAY PONDS – EVAPORATING AND COOLING

WhirlJet and SpiralJet hollow cone nozzles	Section D
FullJet and SpiralJet full cone nozzles	Section B



WASHING – CONVEYOR

VeeJet®, FlatJet® and FloodJet flat spray nozzles	Section C
FullJet full cone nozzles	Section B
SpiralJet hollow cone nozzles	Section D



WASHING – MIST ELIMINATOR

FullJet full cone nozzles	Section B
SpiralJet hollow cone nozzles	Section D



WASHING – PARTS

VeeJet, WashJet® and ProMax Quick VeeJet flat spray nozzles	Section C
ProMax Quick FullJet full cone nozzles	Section B





ORDERING PRODUCTS

In each product section, you'll find ordering examples. Start by reviewing the example and then create the part number by indicating the inlet connection, material and capacity size.

Inlet Conn.	Nozzle Type	—	Material Code	Capacity Size	Example	1/4	G	—	SS	10
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For your convenience, there are multiple ways to place an order: phone, fax and online.

In the U.S. and Canada

Phone: 1.800.95.SPRAY | Fax: 1.888.95.SPRAY

Outside the U.S. and Canada

Phone: 1.630.665.5000 | Fax: 1.630.260.0842

Online ordering is also available. Visit spray.com/sprayfinder. You'll find helpful selection tools, detailed product specs and 3D CAD models for our full product line and live chat for immediate assistance.

FINDING PRODUCTS

- Consult the Product Index on **page i-4** if you know the name of the product
- Consult the Part Number Index on **page i-8** if you have the part number. Part numbers are shown numerically and alpha-numerically
- If you're not sure what you need, our Selection Guidelines on **pages 10-11** will help you identify products typically used in dozens of applications

Selection assistance is also available by calling **1.800.95.SPRAY**. Representatives in your local sales office will help you determine which products best meet your application requirements. (Call **1.630.665.5000** outside North America or visit **spray.com** to find information for the sales office in your area.)

