



Spraying Systems Co.
Experts in Spray Technology



Spray
Nozzles



Spray
Control



Spray
Analysis



Spray
Fabrication



**A Guide to Parts and Equipment Washing,
Rinsing and Drying Using Spray Technology**

TABLE OF CONTENTS

Nozzle Type	Application					Flow Rate Range gpm (l/min)*	Pressure Range psi (bar)
	Rinsing	Washing	High Impact Cleaning	Drying	Agitation Mixing		
OVERVIEW AND OPTIMIZATION STRATEGIES							
CONVENTIONAL SPRAY NOZZLES							
VeeJet®	•	•	•			.035 to 247 (.14 to 944)	5 to 500 (.4 to 35)
FlatJet®			•			.31 to 39 (1.1 to 144)	15 to 150 (1.0 to 10)
FloodJet®	•	•				.03 to 110 (.11 to 410)	3 to 60 (.2 to 4)
WashJet®	•	•	•			.27 to 78 (1 to 290)	300 to 3000 (20 to 200) (up to 4000 {275} for IMEG®)
FullJet®	•	•				.07 to 17.4 (.29 to 65) (up to 25 {92} for narrow angle)	5 to 150 (.4 to 10) (up to 300 {20} for narrow angle)
MFP FullJet	•	•				1.4 to 57 (5.3 to 224)	10 to 80 (.7 to 6)
WhirlJet®	•	•				.05 to 38 (.19 to 145)	3 to 100 (.2 to 7)
SpiralJet®	•	•				.7 to 3320 (2.7 to 11967) .49 to 3320 (2 to 11967)	10 to 400 (.7 to 25) 5 to 400 (.4 to 25)
QUICK-CONNECT SPRAY NOZZLES							
Quick VeeJet	•	•	•			.035 to 68 (.14 to 255)	5 to 300 (.4 to 20)
Quick FlatJet	•	•				3.7 to 15.5 (13.7 to 58)	15 to 150 (1 to 10)
Quick FloodJet	•	•				.01 to 14.7 (.11 to 55)	3 to 60 (.2 to 4)
Quick WashJet, Quick-Connect WashJet	•	•	•			.55 to 17.3 (2 to 64)	300 to 4000 (20 to 275)
Quick FullJet	•	•				.086 to 19.4 (.33 to 72)	5 to 300 (.2 to 20)
Quick WhirlJet	•	•				.05 to 19 (.19 to 72)	3 to 100 (.2 to 7)
QUICK-CONNECT SPRAY NOZZLE SYSTEMS							
ProMax® QuickJet® Clip-Eyelet®	•	•				.07 to 13.6 (.25 to 50)	5 to 150** (.3 to 10**)
Clip-Eyelet®	•	•				.35 to 19.4 (1.2 to 72)	5 to 150** (.3 to 10**)
Adjustable Ball Type	•	•				Depends on spray tip	Up to 125 (8.6)
TANK MIXING EDUCTORS							
Standard Eductors					•	3.5 to 75 (11.3 to 308)	10 to 50 (.5 to 4)
Mini-Eductors					•	.31 to 2.9 (1 to 11.7)	10 to 50 (.5 to 4)
Air Induced Eductors					•	.82 to 3 (3 to 12.1)	15 to 60 (1 to 5)
AIR NOZZLES							
WindJet®				•		5 to 45 scfm (142 to 1237 NI/min)	10 to 125 (.7 to 8.6)
WindJet Air Knife Packages				•		Maximum 1350 cfm (2294 m³/h)	Maximum 125" H ₂ O (311 mbar)

*Flow rate ranges are based on inlet connections shown. Larger connections are available for most products. Consult our *Industrial Spray Products Catalog* or call 1.800.95.SPRAY.

**With Double Clamp

Spray Pattern	Spray Angle	Inlet Connection	Materials	Page No.
				4-6
Solid stream, flat fan	0° to 110°	1/8", 1/4", 3/8", 1/2", 3/4" (M or F)	Choice of metals, Kynar®, PVC	8
Narrow flat fan	15° to 50°	1/8", 1/4", 3/8", 1/2", 3/4" (M)	Choice of metals	8
Wide angle flat fan	75° to 150°	1/8", 1/4", 3/8", 1/2", 3/4", 1" (M)	Choice of metals, PVC	8
Solid stream, flat fan	0° to 65° (up to 80° for IMEG®)	1/8", 1/4" (M or F)	Hardened stainless steel	9
Full cone	15° to 120°	1/8", 1/4", 3/8", 1/2" (M or F)	Choice of metals, PP, PVC, Kynar	9
Full cone	60°, 90° and 115°	3/8", 1/2", 3/4", 1", 1-1/4" (M or F)	Choice of metals	9
Hollow cone	35° to 144°	1/8", 1/4", 3/8", 1/2", 3/4" (M or F)	Choice of metals, PP, PVC	10
Full cone, hollow cone	60° to 170° 50° to 180°	1/4", 3/8", 1/2", 3/4", 1", 1-1/2", 2", 3", 4" (M)	Choice of metals, PTFE; PP, PVC	10
Solid stream, flat fan	0° to 110°	1/8", 1/4", 3/8", 1/2" (M or F)	Choice of metals, ProMax®	12
Narrow flat fan	35° or 50°	3/8", 1/2" (M or F)	Choice of metals	12
Wide angle flat fan	75° to 150°	1/8", 1/4", 3/8", 1/2" (M or F)	Choice of metals	13
Solid stream, flat fan	0° to 65°	1/8", 1/4" (M or F); 1/4" quick-connect	Hardened stainless steel	13
Full cone	15° to 120°	1/8", 1/4", 3/8", 1/2" (M or F)	Choice of metals, ProMax	14
Hollow cone	35° to 144°	1/8", 1/4", 3/8", 1/2" (M or F)	Choice of metals, ProMax	14
Flat spray, full cone, wide full cone, hollow cone, wide hollow cone	25° to 125°	Choice of quick-connect bodies	ProMax	17
Flat spray, extra wide flat spray, hollow cone	15° to 178°	Choice of quick-connect bodies	PP	18
Depends on spray tip	Depends on spray tip	1/4", 3/8", 1/2" (M)	ProMax	18
N/A	N/A	1/4", 3/8", 3/4", 1-1/2" (M)	Stainless steel, PP, Kynar	20
N/A	N/A	1/4" (M)	PP, Kynar	20
N/A	30° to 50°	3/8", 1/2" (F)	Stainless steel, PVC	20
Flat spray, round spray	N/A	1/4" (M or F)	Stainless steel, ABS, PPS, aluminum, Kynar	22
Blower sizes 1 to 30 HP (.75 to 14.1 kW)	Air slot sizes .040" (1 mm) .060" (1.52 mm)	Air knife lengths 3" to 14' (76 mm to 4.3 m)	Air knives: anodized aluminum, stainless steel	23

Optimizing Cleaning, Rinsing and Drying Operations

Product quality problems, lost production time and increasing operating costs can be the unwanted side effects of a spray cleaning or drying system that isn't optimized. Yet, in most applications, it is assumed if nozzles are spraying or blowing, they are providing the needed performance or maximizing efficiency. Unfortunately, that's not the case.

Here's why.

- In most operations, there are many spray nozzles that may satisfy the application requirements. The challenging part is identifying the one nozzle that will provide the best performance and minimize operating costs
- Many nozzles are available in many styles. Choosing a different style that offers performance comparable to your current nozzle may yield many benefits. For example, quick-change nozzles or nozzles that provide automatic alignment and/or easy positioning of the spray tip may simplify and speed maintenance time resulting in more production time
- Nozzle wear is often not visible, especially in the early stages. Nozzles may appear to be operating as expected but could be cleaning the target unevenly or spraying overcapacity and wasting costly chemicals, water and energy and leading to escalating wastewater disposal costs



Optimize performance and lower operating costs with preventive maintenance

Spray nozzles are designed for long-lasting, trouble-free performance. However, like all precision components, spray nozzles do wear over time. Spray performance can suffer and costs can rise. How quickly wear occurs is dependent on a variety of application-specific factors.

Other factors that can negatively impact spray nozzle performance are plugging, erosion, corrosion, scale build-up, caking, accidental damage and improper assembly. These are fairly common in washing and rinsing operations especially when caustic solutions are being used. Establishing and implementing a nozzle maintenance program is the most effective way to prevent and minimize costly spray nozzle problems.

Contact your local representative for assistance in establishing a maintenance program.

Common problems and prevention/troubleshooting tips

Plugging

- Very common with use of recirculated water; use strainers and appropriate filtration devices
- Be sure to specify nozzles with adequate free passage
- Conduct maintenance on a regular basis

Erosion/Wear

- Water and chemicals both cause wear. Conduct appropriate maintenance based on the hardness of the water, spraying pressure, chemical composition and chemical volumes used

Distorted
Spray Pattern



Uniform Spray Pattern

Corrosion

- Many chemicals are extremely corrosive so be sure to specify nozzles in the appropriate materials



Corroded

New

Scale build-up

- Control hardness level of the water
- Use chemical additives as needed
- Conduct maintenance on a regular basis

Accidental damage

- Damage to the orifice can occur during installation, operation or cleaning. Always use proper tools. Clean with tools significantly softer than the construction material of the nozzle such as a toothbrush
- Soak in mild solvent to loosen debris for easier removal with proper equipment



Damaged

New

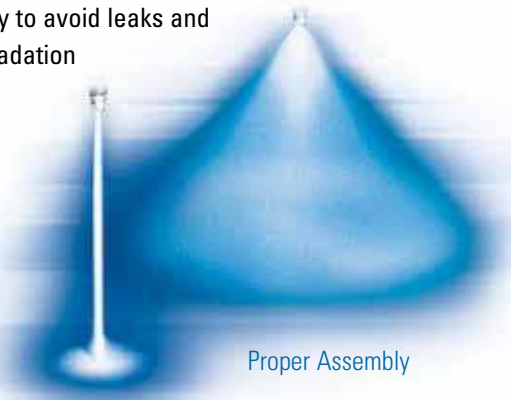
Caking

- Build-up can occur inside the nozzle or on the exterior
- Conduct maintenance on a regular basis

Improper assembly

- Exercise caution when tightening nozzle caps onto bodies. Over tightening can cause thread-stripping
- Be sure internal components are positioned properly to avoid leaks and performance degradation

Improper
Assembly



Proper Assembly

Be sure to determine the optimal maintenance schedule based on the specifics of your operations

Factors to monitor and evaluate:

- **Spray patterns:** Watch for changes in spray angles, distribution and heavy edges
- **Flow rate and pressure:** Check on a regular basis. Wear may be hard to visually detect. Checking flow rates and pressures on nozzles and at a system level will indicate changes in performance
- **Nozzle material:** Determine if an alternative material can extend wear life
- **Spray pressure:** Determine if a reduction is possible to reduce wear without negatively impacting performance
- **Nozzle replacement:** Replace nozzles regularly to avoid quality problems, increased water, chemicals and energy usage and excessive maintenance time

We have the products, services and expertise you need

Working with a single supplier who is an expert in all facets of spray technology is the best way to ensure optimal performance in all your washing, rinsing and drying operations. And, we're uniquely qualified to be that supplier.

We offer:

- The most extensive selection of spray nozzles, air nozzles and eductors in the industry
- Optimization, maintenance, on-site inspection and other educational programs at no cost to help customers improve efficiency
- Sales engineers that specialize only in spray technology and a proven track record of successful washing, rinsing and drying applications

We encourage you to contact us to discuss your specific operations and learn more about how we can help you ensure optimal performance and maximum efficiency.

Call 1.800.95.SPRAY
or visit www.spray.com



Hundreds of Conventional Spray Nozzles

More types, sizes, capacities and materials than any other manufacturer

Conventional hydraulic spray nozzles are widely used in many washing and rinsing operations

And no other manufacturer offers such an extensive line. For low-, medium- and high-pressure operations, we have hundreds of options. Choose from a wide range of spray patterns, spray angles, capacities, sizes and materials to get the performance and efficiency you need.

Flat spray, full cone and hollow cone nozzles are available in a wide range of spray angles, inlet connections, capacities and materials. High-pressure and clog-resistant versions are available in many styles.

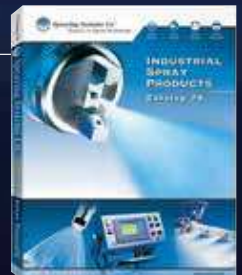
For selection assistance call 1.800.95.SPRAY.



Literature

Industrial Spray Products **Catalog 70**

400-page full-line catalog including information on spray nozzles and accessories plus technical data and problem solving ideas.



VeeJet® Flat Spray Nozzles

Ideal for washing applications where nozzles are aligned to overlap and produce a uniform distribution.

- Choose 0° (solid stream) or narrow sprays for high-impact cleaning
- Flow rate range: .035 to 247 gpm (.14 to 944 l/min)
- Maximum operating pressure: 500 psi (35 bar)
- Spray angles: 0°, 15°, 25°, 40°, 50°, 65°, 73°, 80°, 95°, 110°
- Inlet connections: 1/8", 1/4", 3/8", 1/2", 3/4" NPT or BSPT (M or F)
- Materials: Brass, mild steel, 303 and 316 stainless steel, Kynar®, PVC



See page 12 for the quick-connect version.



FlatJet® Narrow Flat Spray Nozzles

Ideal for thorough washing of parts — precision-machined deflector plane produces uniform, high-impact spray with sharply defined edges.

- Large open flow passages minimize clogging
- Flow rate range: .31 to 39 gpm (1.1 to 144 l/min)
- Maximum operating pressure: 150 psi (10 bar)
- Standard spray angles: 15° to 50°
- Inlet connections: 1/8", 1/4", 3/8", 1/2", 3/4" NPT or BSPT (M)
- Materials: Brass, mild steel, 303 and 316 stainless steel



See page 12 for the quick-connect version.

FloodJet® Wide Angle Flat Spray Nozzles

Ideal for rinsing — a patented, tapered-edge spray eliminates heavy edges and uneven spray.

- Unobstructed flow passages minimize clogging
- Flow rate range: .03 to 110 gpm (.11 to 410 l/min)
- Maximum operating pressure: 60 psi (4 bar)
- Spray angles: 75° to 150°
- Inlet connections: 1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT or BSPT (M)
- Materials: Brass, 303 stainless steel, PVC



See page 13 for the quick-connect version.



WashJet® High-Impact Flat Spray Nozzles

Ideal for high-impact cleaning — WashJet nozzles operate at pressures up to 4000 psi (275 bar).

- Internal guide vane minimizes turbulence and maximizes spray integrity and impact
- Flat fan or solid stream spray pattern
- Flow rate range: .27 to 78 gpm (1.0 to 290 l/min)
- Maximum operating pressure*: 3000 psi (200 bar)
- Standard spray angles*: 0° to 65°
- Inlet connections: 1/8", 1/4" NPT or BSPT (M or F)
- Materials: Specially-hardened stainless steel for long wear life

*IMEG® WashJet nozzles: maximum operating pressure of 4000 psi (275 bar) and spray angles from 0° to 80°.



See page 13 for the quick-connect version.



FullJet® Full Cone Spray Nozzles

Ideal for rinsing chemicals and other residues.

- Choice of standard, wide angle and narrow spray patterns
- Flow rate range: .07 to 17.4 gpm (.29 to 65 l/min)
- Maximum operating pressure: 150 psi (10 bar)
- Standard spray angles: 45° to 90°
- Wide spray angles: 86° to 120°
- Narrow spray angles: 15° to 30°; flow rates up to 25 gpm (92 l/min); maximum operating pressure 300 psi (20 bar)
- Inlet connections: 1/8", 1/4", 3/8", 1/2" NPT or BSPT (M or F)
- Materials: Brass, mild steel, 303 and 316 stainless steel, polypropylene, PVC, Kynar®, cast brass and cast 316 stainless steel for narrow angle versions



See page 14 for the quick-connect version.



Maximum Free Passage FullJet Full Cone Spray Nozzles

Ideal for maximum throughput in washing and rinsing operations using debris-filled or recirculated water.

- Largest free passage of any full cone nozzle
- Flow rate range: 1.4 to 57 gpm (5.3 to 224 l/min)
- Maximum operating pressure: 80 psi (6 bar)
- Standard spray angles: 60°, 90°, 115°
- Inlet connections: 3/8", 1/2", 3/4", 1", 1-1/4" NPT or BSPT (M or F)
- Materials: Brass, 316 stainless steel



WhirlJet® Hollow Cone Spray Nozzles

Ideal for washing and rinsing with minimal clogging — open flow passages ensure excellent spray coverage and provide effective cleaning and rinsing with minimal clogging.

- Flow rate range: .05 to 38 gpm (.19 to 145 l/min)
- Maximum operating pressure: 100 psi (7 bar)
- Standard spray angles: 35° to 90°
- Wide spray angles: 85° to 144°
- Inlet connections: 1/8", 1/4", 3/8", 1/2", 3/4" NPT or BSPT (M or F)
- Materials: Brass, mild steel, 303 and 316 stainless steel, polypropylene, PVC



See page 14 for the quick-connect version.



SpiralJet® Full Cone or Hollow Cone Spray Nozzles

Ideal for rinsing — SpiralJet nozzles provide maximum throughput for any given pipe size.

- Helical design with large flow passages minimizes clogging
- Flow rate range:
 - Full cone: .7 to 3320 gpm (2.7 to 11967 l/min)
 - Hollow cone: .49 to 3320 gpm (2 to 11967 l/min)
- Maximum operating pressure: 400 psi (25 bar)
- Spray angles:
 - Full cone: 60° to 170°
 - Hollow cone: 50° to 180°
- Inlet connections: 1/4", 3/8", 1/2", 3/4", 1", 1-1/2", 2", 3", 4" NPT or BSPT (M)
- Materials: Brass, polypropylene*, PVC, PTFE, cast 316 stainless steel

*Full cone version only.



Quick-Connect Spray Nozzles

Reduce installation and maintenance time

Choose from the broadest line of quick-change nozzles in a wide range of materials

One of the easiest ways to minimize maintenance downtime is to use quick-connect nozzles that require no tools for installation and replacement of spray tips.

Many of our standard hydraulic nozzles are available in quick-connect versions. Our QuickJet® line includes a wide range of flat spray, full cone and hollow cone nozzles in brass, stainless steel and hardened stainless steel.

Our ProMax® QuickJet line also includes a wide range of nozzle options

ProMax QuickJet nozzle bodies and tips are constructed of ProMax, a chemically-coupled, glass-reinforced engineering grade of polypropylene. This unique material is ideal for applications using phosphates, acids, solvents and other caustic solutions. ProMax also resists caking and build-up to minimize plugging.

Plus:

- Easy grip spray tips are removed by hand for fast inspection
- Tips snap into place and lock into the correct position due to an internal stop
- Alignment is automatic with a 10° offset to ensure proper coverage
- PTFE-coated Viton® seal is attached to the tip and provides a positive seal to prevent leaking

Quick-connect flat spray, full cone and hollow cone nozzles are available in a wide range of spray angles, inlet connections, capacities and materials.

For selection assistance call 1.800.95.SPRAY.



Literature

ProMax® QuickJet® Spray Nozzles **Bulletin 514B**

Newly revised 20-page bulletin highlights our line of ProMax nozzles and the time-saving installation/maintenance features. Includes performance data and specifications.



Quick VeeJet® and ProMax® Quick VeeJet Flat Spray Nozzles

- Fast installation and easy/automatic alignment of spray tips
- Miniature versions available for operations where nozzle size and weight are a factor
- Flat and solid stream spray patterns
- Flow rate range:
 - Standard version: .035 to 68 gpm (.14 to 255 l/min)
 - ProMax version: .03 to 15.7 gpm (.22 to .60 l/min)
- Maximum operating pressure:
 - Standard version: 300 psi (20 bar)
 - ProMax version: 200 psi (14 bar)
- Spray angles:
 - Standard version: 0°, 15°, 25°, 40°, 50°, 65°, 73°, 80°, 95°, 110°
 - ProMax version: 25°, 40°, 50°, 65°, 80°, 95°, 110°
- Inlet connections: 1/8", 1/4", 3/8", 1/2" NPT or BSPT (M or F)
- Materials:
 - Standard version: Brass, 303 stainless steel
 - ProMax version: ProMax



Quick FlatJet® Narrow Flat Spray Nozzles

- Fast installation and easy/automatic alignment of spray tips
- Flow rate range: 3.7 to 15.5 gpm (13.7 to 58 l/min)
- Maximum operating pressure: 150 psi (10 bar)
- Spray angles: 35° or 50°
- Inlet connections: 3/8", 1/2" NPT or BSPT (M or F)
- Materials: Brass, 303 stainless steel



Quick FloodJet® Wide Angle Flat Spray Nozzles

- Fast installation and easy/automatic alignment of spray tips
- Flow rate range: .01 to 14.7 gpm (.11 to 55 l/min)
- Maximum operating pressure: 60 psi (4 bar)
- Standard spray angles: 75° to 150°
- Inlet connections: 1/8", 1/4", 3/8", 1/2" NPT or BSPT (M or F)
- Materials: Brass, 303 stainless steel



Quick WashJet® and Quick-Connect WashJet High-Impact Flat Spray Nozzles

- Quick WashJet versions are smaller and lighter than conventional quick-connect nozzles; safety lock feature prevents spray tips from releasing at high pressures
- Quick-connect WashJet versions have a one-piece body design with a 1/4 quick-connect design; locating ribs on nozzle guards streamline nozzle alignment
- Flow rate range*: .55 to 17.3 gpm (2 to 64 l/min)
- Maximum operating pressure*: 3000 psi (200 bar)
- Standard spray angles*: 0° to 65°
- Inlet connections: 1/8", 1/4" NPT or BSPT (M or F)
- Materials: Hardened stainless steel

* IMEG® WashJet nozzles: flow rates up to 15 gpm (57 l/min); maximum operating pressure of 4000 psi (275 bar) and spray angles from 0° to 80°.



Quick FullJet® and ProMax® Quick FullJet Full Cone Spray Nozzles

- Fast installation and easy/automatic alignment of spray tips
- Flow rate range:
 - Standard version: .086 to 19.4 gpm (.33 to 72 l/min)
 - ProMax version: .10 to 5.3 gpm (.38 to 19.4 l/min)
- Maximum operating pressure:
 - Standard version: 300 psi (20 bar)
 - ProMax version: 150 psi (10 bar)
- Standard spray angles: 45° to 90°
- Wide spray angles: 100° to 120°
- Narrow spray angles: 15° to 30°; flow rates up to 25 gpm (92 l/min); maximum operating pressure 300 psi (20 bar)
- Inlet connections: 1/8", 1/4", 3/8", 1/2" NPT or BSPT (M or F)
- Materials:
 - Standard version: Brass, 303 stainless steel
 - ProMax version: ProMax



Quick WhirlJet® and ProMax Quick WhirlJet Hollow Cone Spray Nozzles

- Fast installation and easy/automatic alignment of spray tips
- Flow rate range:
 - Standard version: .05 to 19 gpm (.19 to 72 l/min)
 - ProMax version: .05 to 5.8 gpm (.19 to 22 l/min)
- Maximum operating pressure:
 - Standard version: 100 psi (7 bar)
 - ProMax version: 150 psi (10 bar)
- Standard spray angles: 35° to 90°
- Wide spray angles: 90° to 144°
- Inlet connections:
 - Standard version: 1/8", 1/4", 3/8", 1/2" NPT or BSPT (M or F)
 - ProMax version: 1/4", 3/8" NPT or BSPT (M)
- Materials:
 - Standard version: Brass, 303 stainless steel
 - ProMax version: ProMax



*Maximum pressure depends on temperature.

Quick-Connect Spray Nozzle Systems

Mix and match bodies and tips to get the exact performance you need

Quick-connect spray nozzle systems with snap-on and screw-on pipe connections in ProMax® and polypropylene

These quick-connect spray nozzle systems feature nozzle bodies that easily snap-on the pipe header using a clamp or screw into the pipe header using a single screw. Both body styles can be installed by hand, in seconds, without tools.

Spray tips can also be installed, aligned and positioned quickly and easily by hand. We have dozens of tip options from which to choose – flat spray, full cone, hollow cone, flooding and wide angle sprays. Suitable for use in low-pressure washing and rinsing operations, you can mix and match bodies and tips from our extensive line to get the exact performance you need.

Quick-connect flat spray, full cone and hollow cone nozzle systems are available in a wide range of spray angles, connections and tip styles and capacities.

For selection assistance call 1.800.95.SPRAY.



Literature







Quick-Connect Nozzle Systems **Bulletin 513C**

Detailing our line of quick-connect nozzles, this 20-page brochure covers the time-saving installation and maintenance features of these nozzles including a “snap-on” pipe connection, easy-to-install and replace spray tips and double clamp assemblies. Performance data, assembly options and ordering information are all included.



Quick-Connect Assembly Options

Choose from a wide range of body styles and spray tips to find the perfect combination for your application. First, choose from three body styles. Then, select from dozens of ProMax® QuickJet® or Clip-Eyelet® spray tips or any threaded nozzle. Mix and match as needed – all spray tips can be used with all three body styles.

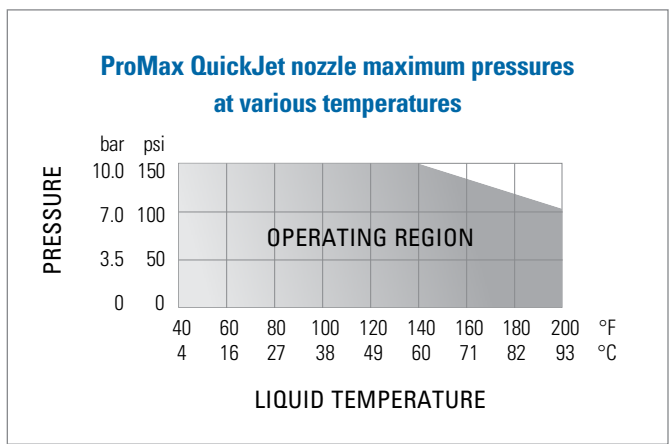
Step 1: Choose the desired body style.		
		
Double Clamp	Single Clamp	38625 HP Eyelet Hinged Clamp Assembly
150 psi (10 bar)	60 psi (4 bar)	125 psi (8.6 bar)
Snap-on connection	Snap-on connection	Single screw, hand-tighten
Fits 1", 1-1/4", 1-1/2", 2" pipe	Fits 1", 1-1/4", 1-1/2", 2" pipe	Fits 1-1/4" or 1-1/2" pipe
Inlet sizes for 9/16" (14.5 mm) or 21/32" (17 mm) dia. drill holes	Inlet sizes for 9/16" (14.5 mm) or 21/32" (17 mm) dia. drill holes	Inlet size of 9/16" (14.5 mm) dia. drill holes
Retrofit seals for 27/32" (21 mm) drill holes	Retrofit seals for 27/32" (21 mm) drill holes	Retrofit seals for 21/32" (17 mm) and 27/32" (21 mm) drill holes
ProMax and stainless steel	ProMax and stainless steel	Body: ProMax Cap: polyphthalamide 180°F (82°C)
Step 2: Choose the desired spray tip. All spray tips are compatible with all body styles.		
		
ProMax QuickJet Ball and ProMax QuickJet Tip	Clip-Eyelet Ball-Type Tip	Threaded Ball and Threaded Nozzle
Tool-free installation	Tool-free installation	Tool-free installation
Automatic spray pattern alignment	Hand positioning of spray tip direction	
Chemically-resistant material	Chemically-resistant material	Chemically-resistant material
Color-coded by capacity	Color-coded by capacity	

An optional high-temperature retainer cap is available. Ask your sales representative for details.

ProMax® QuickJet® Clip-Eyelet® Nozzles

- Flat spray pattern:
 - Flow rate range: .07 to 13.6 gpm (.25 to 50 l/min)
 - Spray angles: 25°, 40°, 50°, 65°, 80°, 95°, 110°
- Full cone spray pattern:
 - Flow rate range: .10 to 5.3 gpm (.26 to 19.4 l/min)
 - Spray angles: 40° to 85°
- Wide angle full cone spray pattern:
 - Flow rate range: .28 to 4.6 gpm (1.2 to 17.2 l/min)
 - Spray angles: 110° to 120°
- Hollow cone spray pattern:
 - Flow rate range: .05 to 5.8 gpm (.12 to 22 l/min)
 - Spray angles: 50° to 80°
- Wide angle hollow cone spray pattern:
 - Flow rate range: .35 to 5.8 gpm (1.2 to 22 l/min)
 - Spray angles: 90° to 125°
- Maximum operating pressure:

Dependent on body style
(see table on page 16)
- Pipe: Dependent on body style
(see table on page 16)
- Material: ProMax



Clip-Eyelet® Nozzles

- Flat spray pattern:
 - Flow rate range: .35 to 19.4 gpm (1.2 to 72 l/min)
 - Spray angles: 15°, 25°, 40°, 50°, 65°, 80°
- Extra wide flat spray pattern:
 - Flow rate range: .35 to 15.5 gpm (1.2 to 58 l/min)
 - Spray angles: 115° to 178°
- Hollow cone spray pattern:
 - Flow rate range: 1.8 to 18.8 gpm (5.8 to 69.3 l/min)
 - Spray angles: 40° to 75°
- Maximum operating pressure: Dependent on body style (see table on page 16)
- Maximum temperature: 180°F (82°C)
- Pipe: Dependent on body style (see table on page 16)
- Material: Glass-reinforced polypropylene



Adjustable Ball-Type Nozzle with Threaded Connection

For operations requiring a threaded pipe connection with the convenience of an adjustable swivel type ball, choose our 37236 ProMax® adjustable ball. It allows easy adjustment of the spray direction without disturbing the pipe connection.

- Accepts ProMax ball for use with ProMax VeeJet®, FullJet® and WhirlJet® tips and a threaded ball for threaded nozzles with 1/4" and 3/8" NPT or BSPT (M) connections
- Inlet connections: 1/4", 3/8" and 1/2" NPT or BSPT (M)
- Adjustability up to 56°
- Maximum operating pressure: 125 psi (8.6 bar)
- Maximum temperature: 180°F (82°C)
- Material: Nozzle – ProMax, Cap – polyphthalamide



Tank Mixing Eductors

Optimize in-tank agitation and mixing

Thorough mixing helps improve product quality and reduces maintenance time

Tank mixing eductors are widely used to effectively and efficiently mix tank solutions. Offering many benefits over other approaches such as pipes with holes, liquid agitators and pumps, tank mixing eductors feature different operating principles and are available in many styles, sizes and materials. Use in anodizing, cleaning, electroplating, mixing, paint booth, phosphating, plating, rinsing and stripping applications.

Tank mixing eductor benefits

- Ensures homogeneous fluid mix throughout the tank. More thorough mixing results in solution uniformity – temperature, pH level, solids/gas dispersion and chemical distribution – to help ensure product/process quality
- Eliminates sludge build-up and minimizes tank cleaning time
- Enables the use of small pumps to circulate large volumes of tank solution
 - Smaller pumps are less costly to purchase
 - Smaller pumps are less costly to operate
- Simplifies operation and maintenance – no moving parts
- Eliminates the need for compressed or blower air and the resulting oil contamination and/or ventilation problems

Tank mixing eductors are available in a variety of styles providing a wide range of effective flow fields.

For selection assistance call 1.800.95.SPRAY.



Literature

A Guide to Optimizing In-Tank Agitation and Mixing Using Eductors **Bulletin 635**

12-page bulletin provides information on tank mixing eductors to ensure thorough mixing, improve product quality and reduce maintenance time. Guidelines provided to help you select the best eductor for your application.



Model 46550 Tank Mixing Eductors

- Large flow passages minimize clogging, maximize liquid circulation
- Entraines four times more solution than pumped solution
- Materials: Kynar®, polypropylene, cast 316 stainless steel
- Inlet connections: 1/4", 3/8", 3/4" and 1-1/2" NPT or BSPT (M)
- Effective flow field: 3' to 46' of flow per second (.91 to 14 m of flow per second)
- Dimensions: 3" to 10" length (76 to 254 mm); 1-1/4" to 4-1/2" (32 to 114 mm) outside diameter



Mini-Eductors

- Compact design maximizes liquid circulation and agitation
- Entraines three to five times more solution than pumped solution as it passes through the eductor/diffuser
- Materials: Polypropylene. PVDF and other similar materials optional
- Effective flow field: 3" to 24" (7.6 to 61 cm) of flow per second
- Inlet connection: 1/4" NPT or BSPT (M)
- Dimensions: 1-5/8" x 11/16" (40 x 17 mm) length x outside dia.



Air Induced Tank Mixing Eductors

- Powerful bubbling action improves cleaning efficiency, tank agitation without compressed air
- Circulated liquid flow is combined with induced air to generate small air bubbles that improve operational efficiency
- Air bubbles provide an added scrubbing action when used for plating, dip cleaning or parts cleaning
- Air bubbles elevate tank particulate and encapsulate debris for easier filtration of tank solution when used for mixing and agitation
- Unique injector design creates a wide 30° to 50° angle for added coverage and capture of particulates
- Liquid flow rate range: .82 to 3 gpm (3 to 12.1 l/min)
- Materials: PVC and stainless steel
- Liquid inlet connections:
 - 3/8" NPT or BSPT (F) for stainless steel models
 - 1/2" NPT or BSPT (F) for PVC models
- Air inlet connections: 1/4" NPT or BSPT (F) – all models



Drying and Blow-Off Solutions

Reduce compressed air consumption and reduce noise with air nozzles

Air nozzles, amplifiers, low-flow air knives and air knife packages provide precise, repeatable drying and dramatically reduce operating costs

If you're using open pipes or pipes with holes/slits to dry parts, you're using more compressed air than is necessary. In fact, compressed air consumption is excessive when compared with alternate approaches. Using air nozzles, air amplifiers or air knives instead of open pipes can reduce air consumption by as much as 92%. In some operations, the use of compressed air can be eliminated completely by using an air knife package powered by a regenerative blower.

Reduction in air consumption

Alternative Methods vs. Open/Drilled/Slit Pipe

Air nozzles that use compressed air	25 to 36% less
Air amplifiers that use compressed air	78 to 90% less
Low flow air knives that use compressed air	89 to 92% less
Air knife packages that use blower air	100% less

Air nozzles and air knife packages offer additional benefits

- Perceived noise reductions range from 28 to 60% with air nozzles. Additional reductions can be achieved with air knife packages
- Worker safety is improved
- More precise, repeatable drying

Air nozzles that use compressed air are available in many styles, capacities, spray patterns, inlet connections and materials. Air knife packages that use blower air are available and completely customizable.

For selection assistance call 1.800.95.SPRAY.



Literature

A Guide to Improving the Performance of Your Drying and Blow-off Applications with WindJet® Air Products
Catalog 20C

24-page catalog includes information on our full line of air control nozzles. An application/selection guide is included as well as noise reduction and cost savings information.



WindJet® AA727 Air Nozzles

- Efficient, controlled flat fan air pattern for a uniform spray distribution
- Low noise levels
- Can be mounted side-by-side for air curtain applications
- 3/16" (4.8 mm) diameter mounting hole for fixed positioning
- Maximum capacity: 43.4 scfm (1198 NI/min)
- Maximum pressure: 100 psi (7 bar)
- Inlet connection: 1/4" NPT (M) or BSPT (M); 1/4" NPT (F) ABS model only
- Materials: ABS, PPS (polyphenylene sulfide), aluminum or stainless steel



AA707 Air Nozzles

- Tightly directed round spray pattern
- Low noise levels
- Maximum capacity: 45 scfm (1237 NI/min)
- Maximum pressure: 125 psi (8.6 bar)
- Inlet connection: 1/4" NPT (M) or BSPT (M); 1/4" NPT (F) ABS model only
- Materials: ABS, PPS (polyphenylene sulfide), Kynar®, aluminum or stainless steel



Y767 Compact Air Nozzles

- Short profile – less than half the height of other air nozzles
- Low noise levels
- Maximum capacity: 29.6 scfm (816 NI/min)
- Maximum pressure: 100 psi (7 bar)
- Inlet connection: 1/4" NPT (M) or BSPT (M)
- Material: ABS



WindJet Low Flow Air Knives

- Patent-pending design provides a uniform air flow across the entire length of the knife
- High velocity, constant air stream for fast drying and blow-off
- Maintenance-free; no moving parts
- Low noise
- Ideal for applications using 1 or 2 air knives
- Air knife standard lengths: 3", 6", 12", 18" and 24" (8, 15, 30, 46 and 61 cm)
- Maximum capacity: 88.8 scfm (2515 NI/min)
- Maximum pressure: 100 psi (7 bar)
- Inlet connection: 1/4" NPT and 1/4" BSPT
- Materials: Anodized aluminum, 316 stainless steel
- Kits are available that include an air knife, shim set, filter, pressure regulator and pressure gauge



WindJet® Variable Air Amplifiers

- Patent-pending design provides a targeted high volume, high velocity amplified air stream for fast drying and blow-off
- Maintenance-free; no moving parts
- Low noise levels
- Outlet ODs: 3/4", 1-1/4", 2" and 4" (19, 32, 51 and 102 mm)
- Maximum outlet capacity: 1207 scfm (34182 NI/min)
- Maximum pressure: 80 psi (5.5 bar)
- Maximum air consumption: 50.3 scfm (1424 NI/min)
- Inlet connection: 1/8", 1/4", 3/8" and 1/2" NPT and BSPT (F)
- Materials: Aluminum, 316 stainless steel
- Kits are available that include an air amplifier, filter, pressure regulator and pressure gauge



WindJet Air Knife Drying and Blow-Off Packages

- Customizable packages include air knives, blower and all accessories
- Unique WindJet Air Knives provide uniform, high volume, constant, controlled air stream
- Easy to set up with visual reference
- Durable, long life span
- Knife lengths from 3" to 14' (76 mm to 4.3 m); custom lengths available
- Air slot sizes of .040" (1 mm) and .060" (1.52 mm)
- Direct-drive regenerative blower provides clean heated air
- Energy-efficient air source
- Low operating noise, eliminating need for sound enclosure
- Easy installation, low maintenance
- Regenerative blower assemblies from 1 to 30 HP (.75 to 14.1 kW)

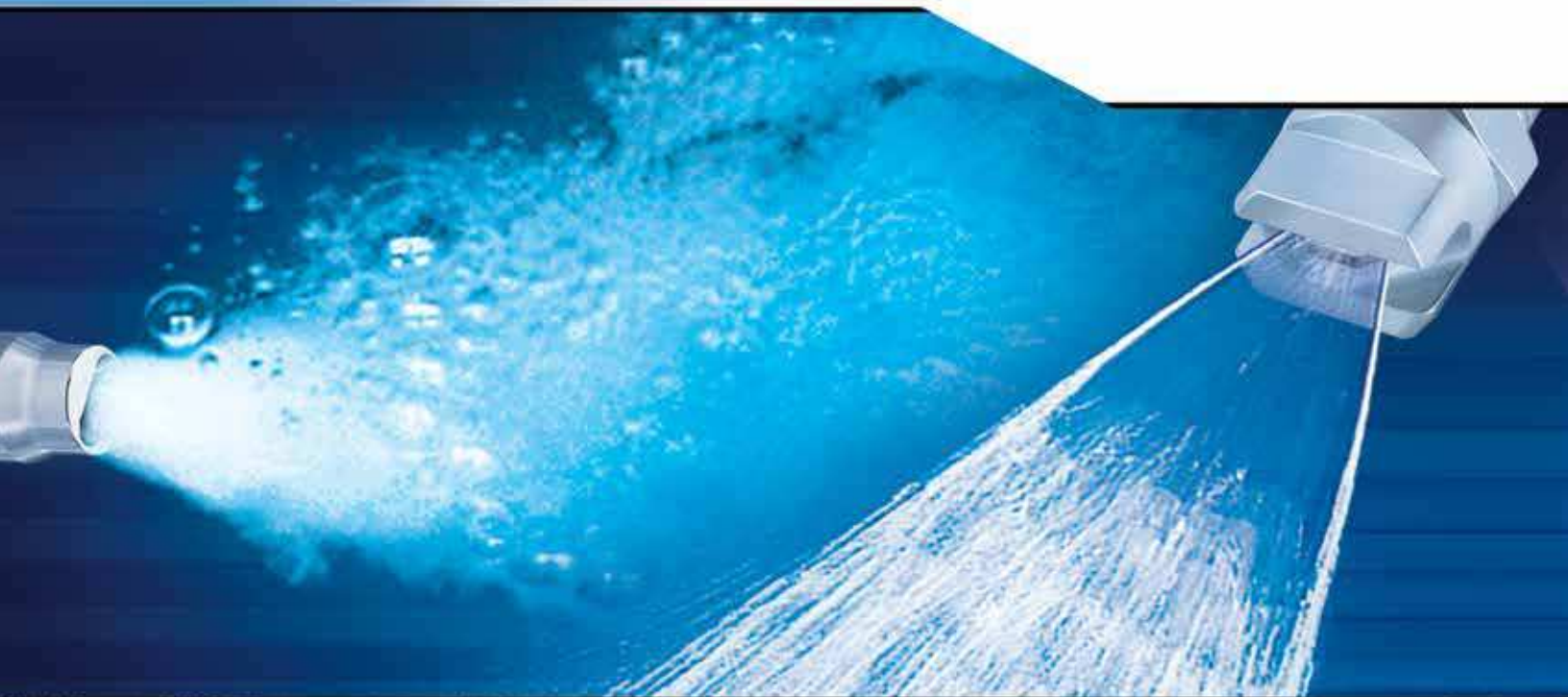


Literature

WindJet® Air Knife Packages Bulletin 543C

20-page bulletin includes information on our customizable packages that include air knives, blower and accessories. Sizing guidelines and complete performance data are included.





Viton® is a registered trademark of DuPont Performance Elastomers.
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