

SPRAY NOZZLES



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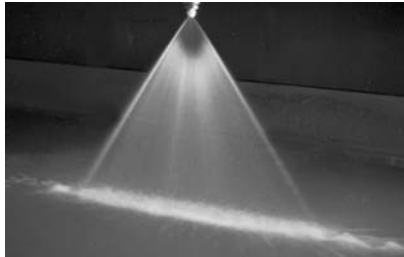
This catalog lists the most popular models of BEX spray nozzles and accessories. Many others are available, often in special materials.
PLEASE NOTE THAT SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

$$\frac{\text{Flow A}}{\text{Flow B}} = \sqrt{\frac{\text{Pressure A}}{\text{Pressure B}}}$$

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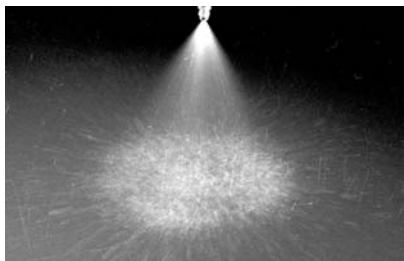
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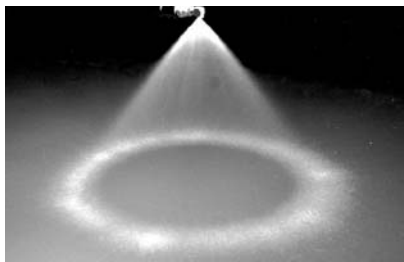
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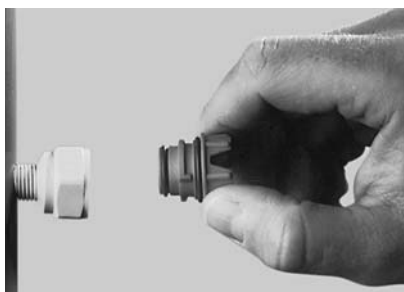
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A variety of special products for special applications.



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JPL Air Atomizing nozzles	inside back cover
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FLAT SPRAY

FULL CONE SPRAY

HOLLOW CONE SPRAY

QUICK DISCONNECT

OTHER NOZZLES

SELECTION GUIDE

This page describes some of the questions to be considered when selecting spray nozzles. In addition, answers for uncomplicated situations are provided where possible. In some applications, because of the large number of variables involved, accurate answers are not always possible except through actual testing or simulation. Our technical staff, however, may be able to lend assistance in their areas of expertise. Please feel free to give us a call.

WHAT SPRAY NOZZLE CONSTRUCTION DO I REQUIRE?

The basic elements of spray nozzle construction are pipe connection, physical dimensions, and material of construction.

PIPE CONNECTION is described by type, size, male, female, or flange. Nozzles described in this catalog have NPT threaded pipe connections (BSPT are also available for most models).

SIZE - Standard sizes from 1/8 NPT to 4" NPT, or as indicated.

MALE AND FEMALE connections are available where indicated.

PHYSICAL DIMENSIONS are listed throughout this catalog. They are set at our factory and we recommend that you do not alter any spray nozzle dimensions, as this could affect spray nozzle performance.

MATERIAL OF CONSTRUCTION

Standard materials are available as noted in this catalog. In addition, many models are available in special materials. Our technical staff will be pleased to discuss your special material requirements with you. BEX nozzles have been produced in the following materials:

Materials	Material Codes
Brass	B
Steel/Cast Iron	I
303 Stainless Steel	3
316 Stainless Steel	6
Hastelloy®	E
Titanium	N
Monel®	O
Carpenter 20®	C
PVC	V
CPVC	A
Acetal	DD
Glass Reinforced Polypropylene (GRP)	L
	LN (molded natural)
PVDF/Kynar	K
	KN (molded natural)
Teflon	T

WHAT SPRAY CHARACTERISTICS DO I REQUIRE?

A spray may be characterized by describing its spray pattern, flow rate, atomization and spray angle. This catalog describes these characteristics for the listed nozzles, for spraying water under controlled conditions.

SPRAY PATTERN: Common spray patterns (flat, full cone, hollow cone) are all described in this catalog. The spray pattern of a nozzle will generally travel further under higher fluid pressures. However, fine mist-like sprays are very susceptible to air movement, and may be carried away by such movement of air.

FLOW RATE: The low rates listed in this catalog are for water in U.S. gallons per minute, unless otherwise indicated. "--" in the capacity table means "not recommended at this pressure."

ATOMIZATION: Atomization is primarily dependent on pressure and viscosity, and varies from point to point within a spray pattern. A range of particle sizes is produced, with some average value which varies according to conditions. For this reason, spray droplet sizes are not listed in this catalog. If you require spray droplet information for critical applications, BEX will be pleased to provide you with measurements, using our in-house laser doppler anemometry equipment.

SPRAY ANGLES: The spray angles listed in this catalog are for water spray under controlled conditions. Under low pressure, the sides of the spray may curve in due to the acceleration of gravity. Spray angles may also be reduced due to the tendency of spray patterns to interfere with themselves or with spray patterns from adjacent nozzles. Table 1 on page 3 lists theoretical spray coverage for a variety of spray angles at various distances from the nozzle.

WHAT FACTORS WILL AFFECT MY SPRAY CHARACTERISTICS?

When the conditions controlling spray nozzle performance change, the spray characteristics may change. This section lists conditions which may vary, and how those conditions may affect the spray characteristics.

PRESSURE: The flow rate of a liquid is proportional to the square root of the pressure difference between the pressure liquid and external (usually atmospheric) conditions, thus

$$\frac{\text{Flow A}}{\text{Flow B}} = \frac{\sqrt{\text{Pressure A}}}{\sqrt{\text{Pressure B}}}$$

higher pressure generally results in finer spray atomization, greater spray impact, and greater spraying distance.

VISCOSITY: Spraying liquids with higher viscosity than water generally results in reduced atomization, and impact. Spray angle will usually decrease.

SPECIFIC GRAVITY: Flow rates shown in this catalog are for water. (The specific gravity of water is 1.0). For liquids with a different specific gravity, flow is given by the formula:

$$\text{Flow} = \text{Water Flow} \times \frac{1}{\sqrt{\text{Spec. gravity}}}$$

SURFACE TENSION: An increase in surface tension generally results in an increase in spray droplet size, and a reduction in spray angle.

SPRAY DROP SIZE (Atomization)

One Inch = 25,400 Microns

- 500 Microns
- 1,200 Microns
- 5,500 Microns

IMPACT

Spray impingement, or "spray impact" as it's otherwise known, can be calculated using several different methods. The most widely used value with regards to nozzle performance is "impact per square inch." However, it's dependent on spray pattern and spray angle. In order to calculate the impact per square inch for a given nozzle, you must first determine the theoretical total impact using the formula below:

Next, using the chart to the right, find the relevant percent per square inch of the theoretical total impact and multiply this by the theoretical total. The result of this equation is the spray impact in pounds per square inch. The greatest impact in pounds per square inch is attained by solid stream nozzles and can be calculated using the formula:

$$1.9 \times (\text{spraying pressure, psi})$$

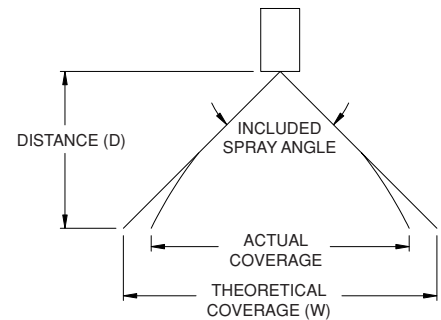
Theoretical Total Impact Spraying Water (pound-force) =

$$.0526 \times (\text{gpm at spraying pressure}) \times \sqrt{\text{spraying pressure, psi}}$$

INCLUDED SPRAY ANGLE	W/D RATIO	Theoretical coverage (W) at various distances (D) from the nozzle									
		Distance (D) inches									
		2	3	4	6	8	12	16	24	34	48
5°	0.087	0.2	0.3	0.3	0.5	0.7	1.0	1.4	2.1	3.0	4.2
10°	0.175	0.3	0.5	0.7	1.0	1.4	2.1	2.8	4.2	5.9	8.4
15°	0.263	0.5	0.8	1.1	1.6	2.1	3.2	4.2	6.3	9.0	12.6
20°	0.353	0.7	1.1	1.4	2.1	2.8	4.2	5.6	8.5	12.0	16.9
25°	0.443	0.9	1.3	1.8	2.7	3.5	5.3	7.1	10.6	15.1	21.3
30°	0.536	1.1	1.6	2.1	3.2	4.3	6.4	8.6	12.9	18.2	25.7
35°	0.631	1.3	1.9	2.5	3.8	5.0	7.6	10.1	15.1	21.4	30.3
40°	0.728	1.5	2.2	2.9	4.4	5.8	8.7	11.6	17.5	24.7	34.9
45°	0.828	1.7	2.5	3.3	5.0	6.6	9.9	13.3	19.9	28.2	39.8
50°	0.933	1.9	2.8	3.7	5.6	7.5	11.2	14.9	22.4	31.7	45
55°	1.04	2.1	3.1	4.2	6.2	8.3	12.5	16.7	25.0	35.4	50
60°	1.15	2.3	3.5	4.6	6.9	9.2	13.9	18.5	27.7	39.3	55
65°	1.27	2.5	3.8	5.1	7.6	10.2	15.3	20.4	30.6	43	61
70°	1.40	2.8	4.2	5.6	8.4	11.2	16.8	22.4	33.6	48	67
75°	1.53	3.1	4.6	6.1	9.2	12.3	18.4	24.6	36.8	52	74
80°	1.68	3.4	5.0	6.7	10.1	13.4	20.1	26.9	40	57	81
85°	1.83	3.7	5.5	7.3	11.0	14.7	22.0	29.3	44	62	88
90°	2.00	4.0	6.0	8.0	12.0	16.0	24.0	32.0	48	68	96
95°	2.18	4.4	6.5	8.7	13.1	17.5	26.2	34.9	52	74	105
100°	2.38	4.8	7.2	9.5	14.3	19.1	28.6	38.1	57	81	114
110°	2.86	5.7	8.6	11.4	17.1	22.9	34.3	46	69	97	137
120°	3.46	6.9	10.4	13.9	20.8	27.7	42	55	83	118	166
130°	4.29	8.6	12.9	17.2	25.7	34.3	51	69	103	146	206
140°	5.49	11.0	16.5	22.0	33.0	44	66	88	132	187	264
150°	7.46	14.9	22.4	29.9	45	60	90	119	179	254	358

Spray Pattern Type	Spray Angle	Percent Impact per sq. in. of Theoretical Total Impact	
Flat Fan	15°	30%	
	25°	20%	
	35°	15%	
	40°	12%	
	50°	10%	
	65°	7%	
Full Cone	80°	5%	
	15°	10%	
	30°	2%	
	50°	1%	
	65°	0.5%	
Hollow Cone	80°	0.2%	
	100°	0.1%	
	70°	1.5%	

At a distance of 12" from nozzle.



Spray coverages shown in Table 1 are based on straight sided spray patterns. At low pressures the sides may curve in, as shown below, because of the acceleration due to gravity.

To find the width of a spray (W) at any distance (D), multiply the W/D ratio by the distance.

OTHER TRADEMARKS FOUND IN THIS CATALOGUE:

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 Teflon® is a registered trademark of E.I. DuPont de Nemours and Company
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 Viton® is a registered trademark of E.I. DuPont de Nemours and Company
 TWK Patent No. 5,316,218
 ZIP-TIP Patent No. 5,421,522 – other patents pending

SELECTION GUIDE

USEFUL CONVERSION FACTORS:

Volume	1 U.S. gallon = 3.785 litre = 0.1337 ft ³ = .003785 m ³ 1 ft ³ = 0.02832 m ³ = 7.48 U.S. gallons
Pressure	1 psi = 6895 N/m ² = 6895 Pa = .069 bar = .069 Kg/cm ² 1 in Hg = 25.4 mm Hg = .4912 psi = 3386 N/m ² 1 in H ₂ O = 25.4 mm H ₂ O = .0361 psi = 249.1 N/m ² 1 atmosphere = 14.7 psi = 29.92 in Hg = 760 mm Hg = 101.325 kN/m ² 1 bar = 14.504 psi = 100 kN/m ² = 1.02 Kg/cm ² 1 foot head (water) = .433 psi
Flow rate	1 U.S. gallon per minute = 0.1337 ft ³ /min = 3.785 l/min 1 ft ³ /sec = .02832 m ³ /sec = 28.32 l/sec
Length	1 in = 25.4 mm 1 ft = .3048 m 1 mile = 1.609 km

EASY PUMP HEAD TABLE

Feet Head (Water)	PSI
10	4.3
20	8.6
30	13
40	17
50	22
60	26
70	30
80	34
90	38
100	42
110	46
120	50
130	54
140	58
150	61

TABLE OF EQUIVALENTS

VOLUMETRIC UNITS - EQUIVALENTS							
Volumetric Unit	Cubic Centimeter	Fluid Ounce	Pound of Water	Liter	US Gallon	Cubic Foot	Cubic Meter
Cubic Centimeter	•	0.034	2.2x10 ⁻³	0.001	2.64x10 ⁻⁴	3.53x10 ⁻⁵	1.0x10 ⁻⁶
Fluid Ounce	29.4	•	0.065	0.030	7.81x10 ⁻³	1.04x10 ⁻³	2.96x10 ⁻⁵
Pound of Water	454	15.4	•	0.454	0.12	0.016	4.54x10 ⁻⁴
Liter	1,000	33.8	2.2	•	0.264	0.035	0.001
US Gallon	3,785	128	8.34	3.785	•	0.134	3.78x10 ⁻³
Cubic Foot	28,320	958	62.4	28.3	7.48	•	0.028
Cubic Meter	1.0x10 ⁶	3.38x10 ⁴	2202	1000	264	35.3	•

LINEAR UNITS - EQUIVALENTS							
Linear Unit	Micron	Mil	Millimeter	Centimeter	Inch	Foot	Meter
Micron	•	0.039	0.001	1.0x10 ⁻⁴	3.94x10 ⁻⁵		
Mil	25.4	•	2.54x10 ⁻²	2.54x10 ⁻³	0.001	8.33x10 ⁻⁵	
Millimeter	1000	39.4	•	0.10	0.0394	3.28x10 ⁻³	0.001
Centimeter	10,000	394	10	•	0.394	0.033	0.01
Inch	2.54x10 ⁴	1,000	25.4	2.54	•	0.083	0.0254
Foot	3.05x10 ⁵	1.2x10 ⁴	305	30.5	12	•	0.305
Meter	1.0x10 ⁶	3.94x10 ⁴	1,000	100	39.4	3.28	•

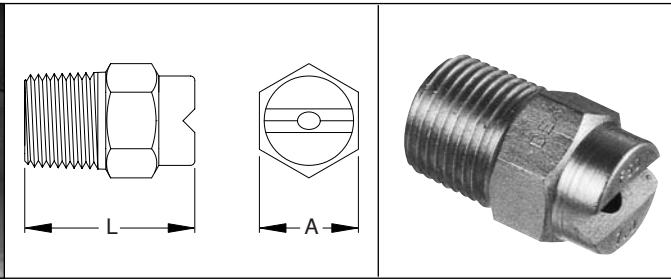
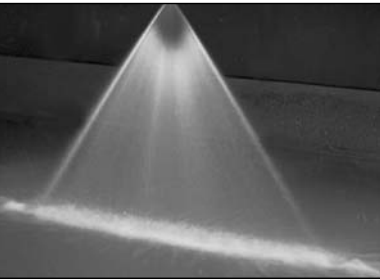
LIQUID PRESSURE - EQUIVALENTS							
Liquid Pressure	Lb/In ² (psi)	Ft Water	Kg/Cm ²	Atmosphere	Bar	Inch Mercury	kPa (kilopascal)
Lb/In ² (psi)	•	2.31	0.070	0.068	0.069	2.04	6.895
Ft Water	0.433	•	0.030	0.029	0.030	0.882	2.99
Kg/Cm ²	14.2	32.8	•	0.968	0.981	29.0	98
Atmosphere	14.7	33.9	1.03	•	1.01	29.9	101
Bar	14.5	33.5	1.02	0.987	•	29.5	100
Inch Mercury	0.491	1.13	0.035	0.033	0.034	•	3.4
kPa (kilopascal)	0.145	0.335	0.01	0.009	0.01	0.296	•

THREADED NOZZLES



F SERIES

Flat "V" spray nozzles



SPRAY CHARACTERISTICS:

F-Series spray nozzles produce a flat, fan-shaped spray pattern, with spray angles available from 5° to 110° measured at 40 psi. Spray angles generally increase with pressure, as shown in the capacity table.

Spray density tapers off toward the outside of these sprays, to permit overlapping of spray patterns while maintaining uniform spray density.

See page 13 for 0° solid stream spray nozzles.

CONSTRUCTION:

The models listed are machined from bar stock and are one piece construction. Standard materials are brass, mild steel, 303 stainless steel and 316 stainless steel. Some models are also stocked in Carpenter 20®, PVC, CPVC and polypropylene. All models are available in either NPT or BSPT threads.

For molded plastic models, please see page 20.

TYPICAL APPLICATIONS:

Suitable for a variety of washing and spraying applications.

- Parts Cleaning
- Metal Washing
- Foam Control
- Asphalt Spraying
- Gravel Washing
- Vehicle Washing
- Fertilizer Spraying
- Dishwashers

DIMENSIONS

NOZZLE NPT PIPE SIZE	Length L (inches)	Dim. A (inches)
1/8F	13/16	7/16 HEX
1/4F	15/16	9/16 HEX
3/8F	1 3/16	1 1/16 HEX
1/2F	1 5/16	7/8 HEX
3/4F	1 11/16	1 1/16 HEX
1F	2 1/2	1 3/8 HEX
1 1/4F	3 5/8	1 3/4 HEX
1 1/2F	4 1/4	2 Dia.
2F	5	2 3/8 Dia.

ACCESSORIES:



Many F-Series flat "V" spray nozzles are also offered in the FT-Series 3-piece setup.

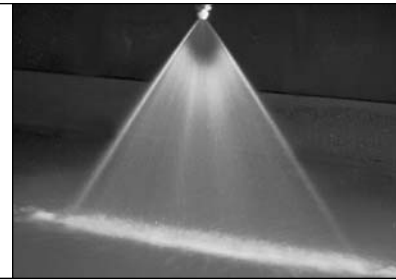
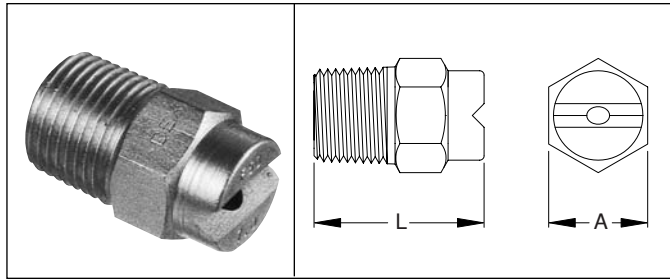
SPRAY ANGLE @ 40psi	MODEL NUMBER	PIPE SIZE NPT	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi
110°	1/8F11003	1/8	0.053	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	96°	110°	118°
	1/4F11003	1/4	0.053	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	92°	110°	118°
	1/8F11004	1/8	0.058	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	90°	110°	112°
	1/4F11004	1/4	0.058	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	90°	110°	112°
	1/8F11005	1/8	0.067	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	96°	110°	114°
	1/4F11005	1/4	0.067	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	96°	110°	114°
	1/8F11006	1/8	0.075	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.6	97°	110°	115°
	1/4F11006	1/4	0.075	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.6	97°	110°	115°
	1/8F11008	1/8	0.091	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	100°	110°	115°
	1/4F11008	1/4	0.091	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	100°	110°	115°
	1/8F11010	1/8	0.105	0.35	0.42	0.5	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	102°	110°	115°
	1/4F11010	1/4	0.105	0.35	0.42	0.5	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	102°	110°	115°
	1/8F11015	1/8	0.129	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.12	2.4	2.9	4.1	102°	110°	115°
	1/4F11015	1/4	0.129	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.12	2.4	2.9	4.1	102°	110°	115°
	1/8F11020	1/8	0.129	0.71	0.84	1.00	1.22	1.41	1.73	2.00	2.2	2.4	2.8	3.2	3.9	5.5	103°	110°	112°
	1/4F11020	1/4	0.129	0.71	0.84	1.00	1.22	1.41	1.73	2.00	2.2	2.4	2.8	3.2	3.9	5.5	103°	110°	112°
	1/4F11030	1/4	0.149	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	103°	110°	112°
	1/4F11040	1/4	0.167	1.41	1.67	2.00	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	103°	110°	112°
	1/4F11050	1/4	0.182	1.77	2.09	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	107°	110°	116°

All references to G.P.M. mean U.S. G.P.M.

FLAT SPRAY

DIMENSIONS

NOZZLE NPT PIPE SIZE	Length L (inches)	Dim. A (inches)
1/8F	13/16	7/16 HEX
1/4F	15/16	9/16 HEX
3/8F	1 3/16	1 1/16 HEX
1/2F	1 5/16	7/8 HEX
3/4F	1 11/16	1 1/16 HEX
1F	2 1/2	1 3/8 HEX
1 1/4F	3 5/8	1 3/4 HEX
1 1/2F	4 1/4	2 Dia.
2F	5	2 3/8 Dia.



ACCESSORIES:

Check Valves:

For use when a complete shut-off is required. See page 71 for details.



FLAT SPRAY

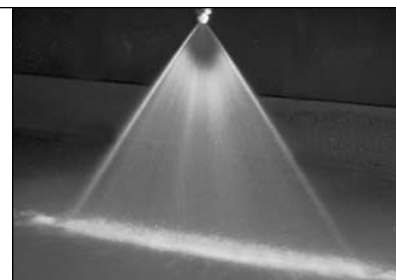
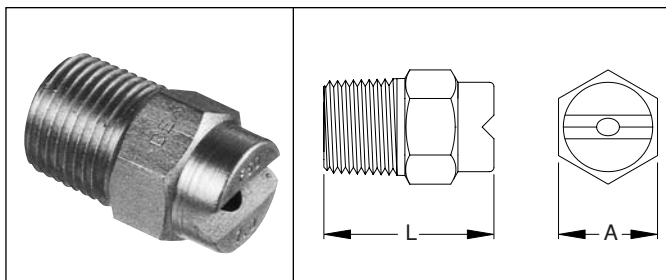
SPRAY ANGLE @ 40psi	MODEL NUMBER	PIPE SIZE NPT	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi
50°	1/2F5020	1/2	0.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	43°	50°	55°
	1/4F5020	1/4	0.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	43°	50°	55°
	3/8F5020	3/8	0.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	43°	50°	55°
	1/8F5030	1/8	0.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	43°	50°	54°
	1/4F5030	1/4	0.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	43°	50°	55°
	3/8F5030	3/8	0.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	43°	50°	54°
	1/8F5040	1/8	0.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	43°	50°	54°
	1/4F5040	1/4	0.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	43°	50°	54°
	3/8F5040	3/8	0.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	43°	50°	54°
	1/4F5050	1/4	0.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	43°	50°	53°
	3/8F5050	3/8	0.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	43°	50°	53°
	1/4F5060	1/4	0.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	43°	50°	53°
	3/8F5060	3/8	0.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	43°	50°	53°
	1/2F5060	1/2	0.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	43°	50°	53°
	1/4F5070	1/4	0.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	44°	50°	53°
	3/8F5070	3/8	0.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	44°	50°	53°
	1/2F5070	1/2	0.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	44°	50°	53°
	3/8F50100	3/8	0.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	44°	50°	52°
	1/2F50100	1/2	0.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	44°	50°	52°
	3/8F50120	3/8	0.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	44°	50°	53°
	1/2F50120	1/2	0.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	44°	50°	53°
	3/8F50150	3/8	0.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	45°	50°	52°
	1/2F50150	1/2	0.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	45°	50°	52°
	1/2F50200	1/2	0.333	7.1	8.4	10.0	12.2	14.1	17.3	20	22	24	28	32	39	55	46°	50°	52°
3/4F50200	3/4	0.333	7.1	8.4	10.0	12.2	14.1	17.3	20	22	24	28	32	39	55	46°	50°	52°	
3/4F50400	3/4	0.471	14.1	16.7	20	24	28	35	40	45	49	57	63	77	110	47°	50°	54°	
1F50500	1	0.527	17.7	21	25	31	35	43	50	56	61	71	79	97	137	46°	50°	55°	
1 1/4F50500	1 1/4	0.527	17.7	21	25	31	35	43	50	56	61	71	79	97	137	46°	50°	55°	
1 1/4F50750	1 1/4	0.645	27	31	38	46	53	65	75	84	92	106	119	145	205	46°	50°	54°	
1 1/4F501000	1 1/4	0.745	35	42	50	61	71	87	100	112	122	141	158	194	274	46°	50°	55°	

CONTINUED on next page...

All references to G.P.M. mean U.S. G.P.M.

DIMENSIONS

NOZZLE NPT PIPE SIZE	Length L (inches)	Dim. A (inches)
1/8F	13/16	7/16 HEX
1/4F	15/16	9/16 HEX
3/8F	1 3/16	1 1/16 HEX
1/2F	1 5/16	7/8 HEX
3/4F	1 11/16	1 1/16 HEX
1F	2 1/2	1 3/8 HEX
1 1/4F	3 5/8	1 3/4 HEX
1 1/2F	4 1/4	2 Dia.
2F	5	2 3/8 Dia.



ACCESSORIES:

A Flow Stabilizer may be required where nozzles are installed close to elbows or tees. See page 70 for this and other accessories.



FLAT SPRAY

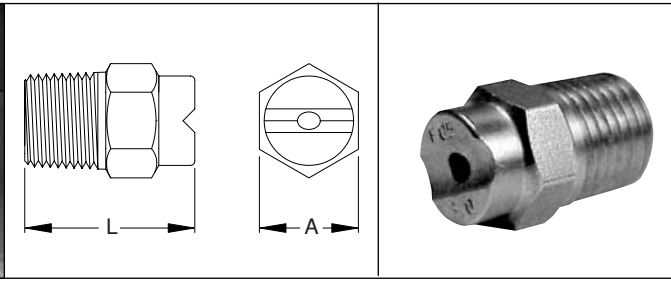
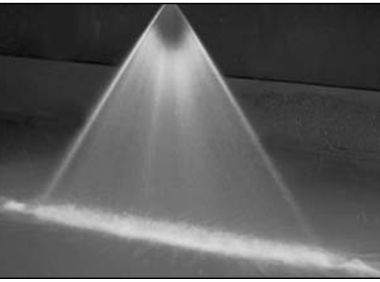
SPRAY ANGLE @ 40 psi	MODEL NUMBER	PIPE SIZE NPT	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi
25°	1/4F2550	1/4	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	20°	25°	32°
	3/8F2550	3/8	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	20°	25°	32°
	1/4F2560	1/4	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	18°	25°	28°
	3/8F2560	3/8	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	18°	25°	28°
	1/4F2570	1/4	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	19°	25°	27°
	3/8F2570	3/8	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	19°	25°	27°
	3/8F25100	3/8	.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	21°	25°	28°
	1/2F25100	1/2	.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	21°	25°	28°
	1/2F25150	1/2	.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	18°	25°	28°
	1/2F25200	1/2	.333	7.1	8.4	10.0	12.2	14.1	17.3	20	22	24	28	32	39	55	19°	25°	27°
15°	1/8F1505	1/8	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	10°	15°	20°
	1/4F1505	1/4	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	10°	15°	20°
	1/8F1506	1/8	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	11°	15°	24°
	1/4F1506	1/4	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	11°	15°	24°
	1/8F1508	1/8	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	11°	15°	21°
	1/4F1508	1/4	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	11°	15°	21°
	1/8F1510	1/8	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	13°	15°	16°
	1/4F1510	1/4	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	13°	15°	16°
	1/8F1515	1/8	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	11°	15°	20°
	1/4F1515	1/4	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	11°	15°	20°
	3/8F1515	3/8	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	11°	15°	20°
	1/8F1520	1/8	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	11°	15°	20°
	1/4F1520	1/4	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	11°	15°	20°
	3/8F1520	3/8	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	11°	15°	18°
	1/8F1530	1/8	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	11°	15°	18°
	1/4F1530	1/4	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	12°	15°	18°
	3/8F1530	3/8	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	12°	15°	18°
	1/4F1540	1/4	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	12°	15°	18°
	3/8F1540	3/8	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	12°	15°	19°
	1/4F1550	1/4	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	12°	15°	19°
	3/8F1550	3/8	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	12°	15°	19°
	1/4F1560	1/4	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	12°	15°	17°
	3/8F1560	3/8	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	12°	15°	17°
	1/4F1570	1/4	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	12°	15°	19°
	3/8F1570	3/8	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	12°	15°	19°
	3/8F15100	3/8	.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	12°	15°	19°
	1/2F15100	1/2	.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	12°	15°	19°
	3/8F15120	3/8	.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	12°	15°	19°
	1/2F15120	1/2	.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	12°	15°	18°
	3/8F15150	3/8	.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	12°	15°	18°
1/2F15150	1/2	.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	12°	15°	18°	
1/2F15200	1/2	.333	7.1	8.4	10.0	12.2	14.1	17.3	20	22	24	28	32	39	55	13°	15°	17°	

CONTINUED on next page...

All references to G.P.M. mean U.S. G.P.M.

F SERIES

Flat "V" spray nozzles continued



DIMENSIONS

NOZZLE NPT PIPE SIZE	Length L (inches)	Dim. A (inches)
1/8F	13/16	7/16 HEX
1/4F	15/16	9/16 HEX
3/8F	13/16	11/16 HEX
1/2F	15/16	7/8 HEX
3/4F	1 11/16	1 1/16 HEX
1F	2 1/2	1 3/8 HEX
1 1/4F	3 5/8	1 3/4 HEX
1 1/2F	4 1/4	2 Dia.
2F	5	2 3/8 Dia.

ACCESSORIES:

Adjustable joints may be used to accurately orient a spray pattern. See page 70 for this and other accessories.



FLAT SPRAY

SPRAY ANGLE @ 40 psi	MODEL NUMBER	PIPE SIZE NPT	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi
5°	1/8F0505	1/8	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	4°	5°	9°
	1/4F0505	1/4	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	4°	5°	9°
	1/8F0506	1/8	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	5°	5°	8°
	1/4F0506	1/4	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	5°	5°	8°
	1/8F0508	1/8	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	4°	5°	7°
	1/4F0508	1/4	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	4°	5°	7°
	1/8F0510	1/8	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	5°	5°	8°
	1/4F0510	1/4	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	5°	5°	8°
	1/8F0515	1/8	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	5°	5°	9°
	1/4F0515	1/4	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	5°	5°	9°
	3/8F0515	3/8	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	5°	5°	9°
	1/8F0520	1/8	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	5°	5°	9°
	1/4F0520	1/4	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	5°	5°	9°
	3/8F0520	3/8	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	5°	5°	9°
	1/8F0530	1/8	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	5°	5°	9°
	1/4F0530	1/4	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	5°	5°	9°
	3/8F0530	3/8	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	5°	5°	9°
	1/4F0540	1/4	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	5°	5°	9°
	3/8F0540	3/8	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	5°	5°	9°
	1/4F0550	1/4	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	5°	5°	10°
3/8F0550	3/8	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	5°	5°	10°	
1/4F0560	1/4	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	5°	5°	10°	
3/8F0560	3/8	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	5°	5°	10°	
1/4F0570	1/4	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	5°	5°	10°	
3/8F0570	3/8	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	5°	5°	10°	
3/8F05100	3/8	.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	5°	5°	19°	
3/8F05120	3/8	.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	5°	5°	19°	
3/8F05150	3/8	.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	5°	5°	18°	

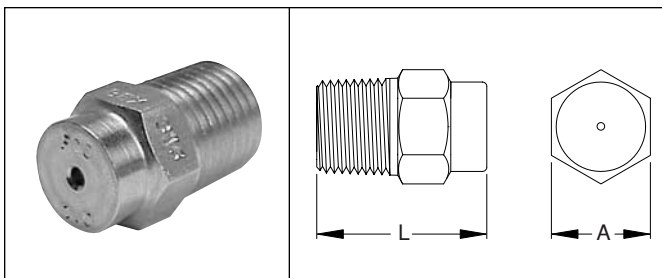
All references to G.P.M. mean U.S. G.P.M.

Solid stream spray nozzles

F SERIES

DIMENSIONS

NOZZLE NPT PIPE SIZE	Length L (inches)	Dim. A (inches)
1/8F	13/16	7/16 HEX
1/4F	15/16	9/16 HEX
3/8F	1 3/16	1 1/16 HEX
1/2F	1 5/16	7/8 HEX
3/4F	1 11/16	1 1/8 HEX
1F	2 1/2	1 3/8 HEX
1 1/4F	3 5/8	1 3/4 HEX
1 1/2F	4 1/4	2 Dia.
2F	5	2 3/8 Dia.



SPRAY CHARACTERISTICS:

A high impact solid stream. For situations where maximum impact is required over a very small target area:

- Metal Wash
- Agitation
- Mixing

CONSTRUCTION:

The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, steel, 303 stainless steel and 316 stainless steel.

For molded plastic models, please see page 20.

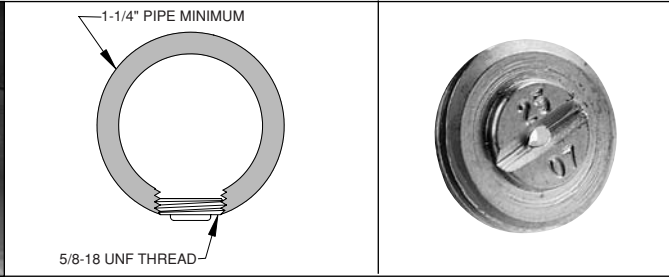
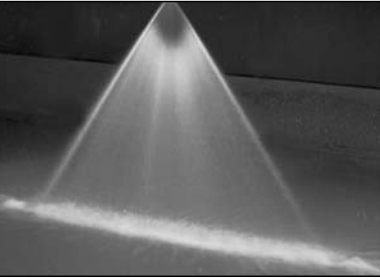
FLAT SPRAY

SPRAY ANGLE @ 40psi	MODEL NUMBER	PIPE SIZE NPT	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY ANGLE @			
				5 psi	7 psi	10 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	200 psi	300 psi	400 psi	500 psi	20 psi	40 psi	80 psi
0°	1/8F0003	1/8	.041	0.11	0.13	0.15	0.21	0.26	0.30	0.37	0.42	0.47	0.67	0.82	0.95	1.06	0° Solid Stream		
	1/4F0003	1/4	.041	0.11	0.13	0.15	0.21	0.26	0.30	0.37	0.42	0.47	0.67	0.82	0.95	1.06			
	1/8F0004	1/8	.047	0.14	0.17	0.20	0.28	0.35	0.40	0.49	0.57	0.63	0.89	1.10	1.26	1.41			
	1/4F0004	1/4	.047	0.14	0.17	0.20	0.28	0.35	0.40	0.49	0.57	0.63	0.89	1.10	1.26	1.41			
	1/8F0005	1/8	.053	0.18	0.21	0.25	0.35	0.43	0.50	0.61	0.71	0.79	1.12	1.37	1.58	1.77			
	1/4F0005	1/4	.053	0.18	0.21	0.25	0.35	0.43	0.50	0.61	0.71	0.79	1.12	1.37	1.58	1.77			
	1/8F0006	1/8	.058	0.21	0.25	0.30	0.42	0.52	0.60	0.73	0.85	0.95	1.34	1.64	1.90	2.1			
	1/4F0006	1/4	.058	0.21	0.25	0.30	0.42	0.52	0.60	0.73	0.85	0.95	1.34	1.64	1.90	2.1			
	1/8F0008	1/8	.067	0.28	0.33	0.40	0.57	0.69	0.80	0.98	1.13	1.26	1.79	2.2	2.5	2.8			
	1/4F0008	1/4	.067	0.28	0.33	0.40	0.57	0.69	0.80	0.98	1.13	1.26	1.79	2.2	2.5	2.8			
	1/8F0010	1/8	.075	0.35	0.42	0.50	0.71	0.87	1.00	1.22	1.41	1.58	2.2	2.7	3.2	3.5			
	1/4F0010	1/4	.075	0.35	0.42	0.50	0.71	0.87	1.00	1.22	1.41	1.58	2.2	2.7	3.2	3.5			
	1/8F0015	1/8	.091	0.53	0.63	0.75	1.06	1.30	1.50	1.84	2.1	2.4	3.4	4.1	4.7	5.3			
	1/4F0015	1/4	.091	0.53	0.63	0.75	1.06	1.30	1.50	1.84	2.1	2.4	3.4	4.1	4.7	5.3			
	1/8F0020	1/8	.105	0.71	0.84	1.00	1.41	1.73	2.0	2.4	2.8	3.2	4.5	5.5	6.3	7.1			
	1/4F0020	1/4	.105	0.71	0.84	1.00	1.41	1.73	2.0	2.4	2.8	3.2	4.5	5.5	6.3	7.1			
	1/8F0030	1/8	.129	1.06	1.25	1.50	2.1	2.6	3.0	3.7	4.2	4.7	6.7	8.2	9.5	10.6			
	1/4F0030	1/4	.129	1.06	1.25	1.50	2.1	2.6	3.0	3.7	4.2	4.7	6.7	8.2	9.5	10.6			
	1/8F0040	1/8	.149	1.41	1.67	2.0	2.8	3.5	4.0	4.9	5.7	6.3	8.9	11.0	12.6	14.1			
	1/4F0040	1/4	.149	1.41	1.67	2.0	2.8	3.5	4.0	4.9	5.7	6.3	8.9	11.0	12.6	14.1			
	3/8F0040	3/8	.149	1.41	1.67	2.0	2.8	3.5	4.0	4.9	5.7	6.3	8.9	11.0	12.6	14.1			
	1/4F0050	1/4	.167	1.77	2.1	2.5	3.5	4.3	5.0	6.1	7.1	7.9	11.2	13.7	15.8	17.7			
	3/8F0050	3/8	.167	1.77	2.1	2.5	3.5	4.3	5.0	6.1	7.1	7.9	11.2	13.7	15.8	17.7			
	1/4F0060	1/4	.182	2.1	2.5	3.0	4.2	5.2	6.0	7.3	8.5	9.5	13.4	16.4	19.0	21			
3/8F0060	3/8	.182	2.1	2.5	3.0	4.2	5.2	6.0	7.3	8.5	9.5	13.4	16.4	19.0	21				
1/4F0070	1/4	.197	2.5	2.9	3.5	4.9	6.1	7.0	8.6	9.9	11.1	15.7	19.2	22	25				
3/8F0070	3/8	.197	2.5	2.9	3.5	4.9	6.1	7.0	8.6	9.9	11.1	15.7	19.2	22	25				
1/4F0080	1/4	.211	2.8	3.3	4.0	5.7	6.9	8.0	9.8	11.3	12.6	17.9	22	25	28				
3/8F0080	3/8	.211	2.8	3.3	4.0	5.7	6.9	8.0	9.8	11.3	12.6	17.9	22	25	28				
3/8F00100	3/8	.236	3.5	4.2	5.0	7.1	8.7	10.0	12.2	14.1	15.8	22	27	32	35				
3/8F00120	3/8	.258	4.2	5.0	6.0	8.5	10.4	12.0	14.7	17.0	19.0	27	33	38	42				
1/2F00120	1/2	.258	4.2	5.0	6.0	8.5	10.4	12.0	14.7	17.0	19.0	27	33	38	42				
1/2F00150	1/2	.289	5.3	6.3	7.5	10.6	13.0	15.0	18.4	21	24	34	41	47	53				
1/2F00200	1/2	.333	7.1	8.4	10.0	14.1	17.3	20	24	28	32	45	55	63	71				
3/4F00250	3/4	.373	8.8	10.5	12.5	17.7	22	25	31	35	40	56	68	79	88				
3/4F00350	3/4	.441	12.4	14.6	17.5	25	30	35	43	49	55	78	96	111	124				
3/4F00400	3/4	.471	14.1	16.7	20	28	35	40	49	57	63	89	110	126	141				
3/4F00500	3/4	.527	17.7	21	25	35	43	50	61	71	79	112	137	158	177				
3/4F00700	3/4	.623	25	29	35	49	61	70	86	99	111	157	192	221	247				
1F001000	1	.745	35	42	50	71	87	100	122	141	158	220	274	316	354				

All references to G.P.M. mean U.S. G.P.M.

STF SERIES

Flat "V" spray nozzles



SPRAY CHARACTERISTICS:

STF spray nozzles produce a flat, fan-shaped spray pattern, similar to the F Series. Spray angles are available for a 0° solid stream to 90°, measured at 40 psi. Spray angles generally increase with pressure, as shown in the capacity table below.

Spray density tapers off toward the outside edges of these sprays, to permit overlapping of spray patterns while maintaining uniform spray density.

CONSTRUCTION:

The STF are disc-shaped, with a male 5/8-18 straight thread. They are machined from bar stock, and are one piece construction. Standard materials are 303 stainless steel and 316 stainless steel. Some models are also available in other materials.

TYPICAL APPLICATIONS:

The STF series is designed for applications where space is at a minimum, or where the nozzles must not protrude from the header. Typically the outer surface of the nozzle is flush with the outside of the header.

(NOTE: Certain models will protrude slightly).

FLAT SPRAY

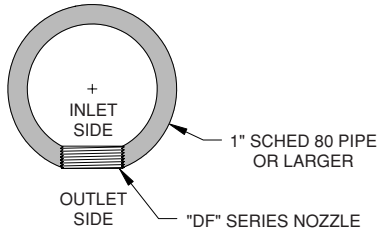
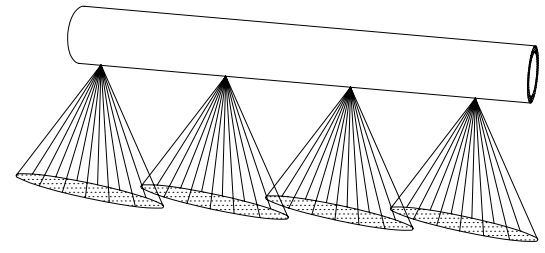
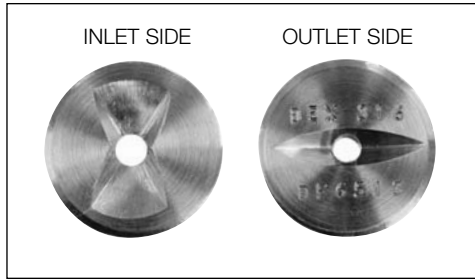
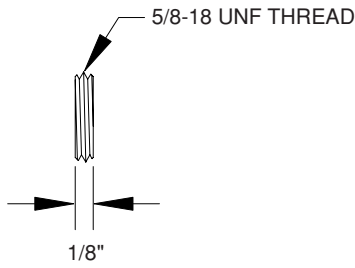
SPRAY ANGLE @ 40psi	MODEL NUMBER	EQUIV. ORIFICE DIAMETER (Inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
			10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	200 psi	250 psi	300 psi	20 psi	40 psi	80 psi
0°	STF0003	0.041	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.67	0.75	0.82	0°	0°	0°
	STF0007	0.062	0.35	0.43	0.49	0.61	0.70	0.78	0.86	0.99	1.11	1.36	1.57	1.75	1.92	0°	0°	0°
25°	STF2507	0.062	0.35	0.43	0.49	0.61	0.70	0.78	0.86	0.99	1.11	1.36	1.57	1.75	1.92	19°	25°	26°
50°	STF50084	0.068	0.42	0.51	0.59	0.73	0.84	0.94	1.03	1.19	1.33	1.63	1.88	2.1	2.3	42°	50°	57°
	STF5013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	2.9	3.3	3.6	44°	50°	56°
	STF5019	0.102	0.95	1.16	1.34	1.65	1.90	2.1	2.3	2.7	3.0	3.7	4.2	4.8	5.2	45°	50°	54°
60°	STF6003	0.041	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.67	0.75	0.82	50°	60°	65°
	STF50054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	1.21	1.35	1.48	52°	60°	64°
	STF60093	0.072	0.47	0.57	0.66	0.81	0.93	1.04	1.14	1.32	1.47	1.80	2.1	2.3	2.5	56°	60°	66°
	STF6013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	2.9	3.3	3.6	55°	60°	64°
	STF6020	0.105	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	4.5	5.0	5.5	55°	60°	63°
	STF6024	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	5.4	6.0	6.6	58°	60°	66°
	STF6033	0.135	1.65	2.0	2.3	2.9	3.3	3.7	4.0	4.7	5.2	6.4	7.4	8.3	9.0	58°	60°	64°
	STF6040	0.148	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	8.9	10	11	57°	60°	62°
65°	STF6047	0.161	2.4	2.9	3.3	4.1	4.7	5.3	5.8	6.6	7.4	9.1	10.5	11.8	12.9	58°	60°	62°
	STF6088	0.220	4.4	5.4	6.2	7.6	8.8	9.8	10.8	12.4	13.9	17.0	19.7	22	24	58°	60°	62°
	STF65054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	1.21	1.35	1.48	55°	65°	72°
	STF6513	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	2.9	3.3	3.6	57°	65°	70°
	STF6519	0.102	0.95	1.16	1.34	1.65	1.90	2.1	2.3	2.7	3.0	3.7	4.2	4.8	5.2	60°	65°	69°
	STF6520	0.105	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	4.5	5.0	5.5	62°	65°	69°
68°	STF6524	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	5.4	6.0	6.6	62°	65°	67°
	STF6588	0.220	4.4	5.4	6.2	7.6	8.8	9.8	10.8	12.4	13.9	17.0	19.7	22	24	61°	65°	69°
80°	STF6824	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	5.4	6.0	6.6	65°	68°	70°
90°	STF8004	0.047	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	0.89	1.00	1.10	75°	80°	84°
	STF80054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	1.21	1.35	1.48	72°	80°	87°
	STF80084	0.068	0.41	0.50	0.58	0.71	0.82	0.92	1.00	1.16	1.30	1.59	1.83	2.1	2.2	76°	80°	84°
	STF80093	0.072	0.47	0.57	0.66	0.81	0.93	1.04	1.14	1.32	1.47	1.80	2.1	2.3	2.5	74°	80°	84°
	STF8010	0.074	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.2	2.5	2.7	75°	80°	86°
	STF8013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	2.9	3.3	3.6	76°	80°	85°
	STF8024	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	5.4	6.0	6.6	75°	80°	83°
STF8033	0.135	1.65	2.0	2.3	2.9	3.3	3.7	4.0	4.7	5.2	6.4	7.4	8.3	9.0	76°	80°	82°	
90°	STF90054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	1.21	1.35	1.48	82°	90°	96°
	STF90093	0.072	0.47	0.57	0.66	0.81	0.93	1.04	1.14	1.32	1.47	1.80	2.1	2.3	2.5	83°	90°	95°
	STF9013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	2.9	3.3	3.6	85°	90°	93°

All references to G.P.M. mean U.S. G.P.M.

See pages 2, 3 and 4 for engineering data and spray coverage.

Threaded disc flat "V" spray nozzles (low profile)

DF SERIES

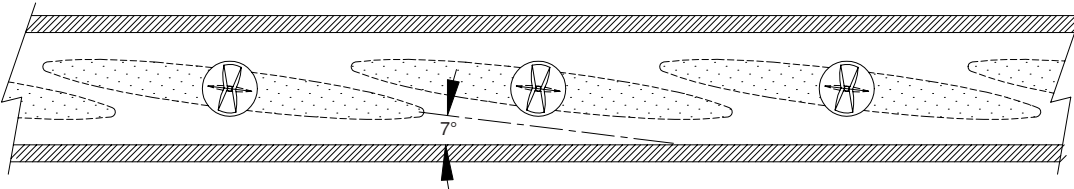


SPRAY CHARACTERISTICS:

These thin-disc flat spray nozzles are used where the nozzle must not project beyond the wall of the header pipe. Minimum recommended pipe size is 1" schedule 80. Optimum thread engagement occurs on pipes of 1-1/4" schedule 80 and larger. Usual operating pressures are up to 150 psi.

CONSTRUCTION:

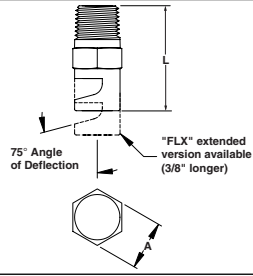
Standard materials of construction are 316 stainless steel and 303 stainless steel. Other materials and capacities can be supplied.



10 - 15% overlap is recommended for complete coverage

MODEL NUMBER	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @ 40 psi
		10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	
DF35054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	35°
DF3513	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	35°
DF3524	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	35°
DF3533	0.135	1.65	2.0	2.3	2.9	3.3	3.7	4.0	4.7	5.2	6.4	35°
DF4013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	40°
DF4047	0.161	2.4	2.9	3.3	4.1	4.7	5.3	5.8	6.6	7.4	9.1	40°
DF4313	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	43°
DF5013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	50°
DF55054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	55°
DF55084	0.068	0.42	0.51	0.59	0.73	0.84	0.94	1.03	1.19	1.33	1.63	55°
DF5513	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	55°
DF5824	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	58°
DF5833	0.135	1.65	2.0	2.3	2.9	3.3	3.7	4.0	4.7	5.2	6.4	58°
DF6022	0.110	1.10	1.35	1.56	1.91	2.2	2.5	2.7	3.1	3.5	4.3	60°
DF65054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	65°
DF6513	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	65°
DF6515	0.091	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	65°
DF6519	0.102	0.95	1.16	1.34	1.65	1.90	2.1	2.3	2.7	3.0	3.7	65°
DF6524	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	65°
DF6840	0.148	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	68°
DF70054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	70°
DF80054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	80°
DF80084	0.068	0.42	0.51	0.59	0.73	0.84	0.94	1.03	1.19	1.33	1.63	80°
DF8013	0.085	0.65	0.80	0.92	1.13	1.30	1.45	1.59	1.84	2.1	2.5	80°
DF8019	0.102	0.95	1.16	1.34	1.65	1.90	2.1	2.3	2.7	3.0	3.7	80°
DF8024	0.115	1.20	1.47	1.70	2.1	2.4	2.7	2.9	3.4	3.8	4.6	80°
DF8033	0.135	1.65	2.0	2.3	2.9	3.3	3.7	4.0	4.7	5.2	6.4	80°
DF90054	0.055	0.27	0.33	0.38	0.47	0.54	0.60	0.66	0.76	0.85	1.05	90°
DF11006	0.058	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	110°

All references to G.P.M. mean U.S. G.P.M.



SPRAY CHARACTERISTICS:

A wide, flat fan-shaped spray with low impact. The spray is deflected 75° away from the centerline of the pipe connection, as shown.

CONSTRUCTION:

The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models

are also available in other materials, such as PVC, CPVC, Teflon® and polypropylene.



TYPICAL APPLICATIONS:

Wherever a low impact, wide angle spray is required.

- Rinsing and Cooling
- Dishwashing
- Fertilizer Spraying
- Metal Wash

MODEL NUMBER	PIPE SIZE NPT	ORIFICE DIA. (inches)	DIMENSIONS		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @					
			A	L	3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	3 psi	5 psi	7 psi	10 psi	20 psi	60 psi	
1/8FL.25	1/8	0.017	7/16 Hex	9/16	--	--	--	0.03	0.03	0.04	0.04	0.05	0.06	--	--	--	90°	106°	120°	
1/8FL.50	1/8	0.024	7/16 Hex	9/16	--	--	0.04	0.05	0.06	0.07	0.09	0.10	0.12	--	--	65°	78°	99°	120°	
1/8FL.75	1/8	0.029	7/16 Hex	13/16	--	--	0.06	0.08	0.09	0.11	0.13	0.15	0.18	--	--	72°	85°	112°	140°	
1/8FL1	1/8	0.033	7/16 Hex	13/16	--	--	0.08	0.10	0.12	0.14	0.17	0.20	0.24	--	--	90°	97°	135°	148°	
1/8FL1.3	1/8	0.038	7/16 Hex	13/16	--	0.09	0.11	0.13	0.16	0.18	0.23	0.26	0.32	--	73°	80°	92°	115°	134°	
1/8FL1.5	1/8	0.042	7/16 Hex	13/16	0.08	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.37	57°	69°	75°	87°	104°	125°	
1/8FL2	1/8	0.047	7/16 Hex	13/16	0.11	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.49	60°	73°	82°	86°	104°	125°	
1/8FL2.5	1/8	0.055	7/16 Hex	13/16	0.14	0.18	0.21	0.25	0.31	0.36	0.44	0.51	0.62	749°	87°	92°	101°	112°	130°	
1/8FL3	1/8	0.059	7/16 Hex	13/16	0.16	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	84°	97°	106°	115°	130°	140°	
1/8FL4	1/8	0.070	7/16 Hex	15/16	0.22	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.98	74°	87°	89°	101°	116°	127°	
1/8FL5	1/8	0.076	7/16 Hex	15/16	0.27	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	78°	89°	97°	103°	113°	132°	
1/8FL7.5	1/8	0.094	7/16 Hex	15/16	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	98°	105°	112°	120°	132°	144°	
1/8FL10	1/8	0.110	7/16 Hex	15/16	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	116°	125°	135°	137°	144°	150°	
1/8FL12	1/8	0.120	9/16 Hex	1 1/16	0.66	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	98°	105°	109°	118°	134°	139°	
1/8FL15	1/8	0.129	9/16 Hex	1 1/16	0.82	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	100°	110°	115°	124°	131°	139°	
1/8FL18	1/8	0.147	9/16 Hex	1 1/16	0.99	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	100°	112°	116°	124°	135°	137°	
1/8FL20	1/8	0.154	9/16 Hex	1 1/16	1.10	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	115°	125°	128°	134°	142°	147°	
1/4FL1.3	1/4	0.038	9/16 Hex	15/16	0.07	0.09	0.11	0.13	0.16	0.18	0.23	0.26	0.32	52°	62°	71°	81°	97°	116°	
1/4FL1.5	1/4	0.042	9/16 Hex	15/16	0.08	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.37	57°	70°	77°	85°	103°	122°	
1/4FL2	1/4	0.047	9/16 Hex	15/16	0.11	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.49	62°	76°	84°	96°	110°	134°	
1/4FL2.5	1/4	0.055	9/16 Hex	15/16	0.14	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.61	88°	110°	114°	126°	145°	152°	
1/4FL3	1/4	0.059	9/16 Hex	15/16	0.16	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	77°	91°	99°	104°	128°	149°	
1/4FL4	1/4	0.070	9/16 Hex	1	0.22	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.98	65°	73°	82°	87°	96°	104°	
1/4FL5	1/4	0.076	9/16 Hex	1	0.27	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	69°	84°	89°	97°	107°	124°	
1/4FL7.5	1/4	0.094	9/16 Hex	1	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	90°	104°	122°	133°	145°	150°	
1/4FL10	1/4	0.110	9/16 Hex	1	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	125°	130°	134°	137°	148°	156°	
1/4FL12	1/4	0.120	9/16 Hex	1 5/16	0.66	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	110°	115°	122°	130°	141°	150°	
1/4FL15	1/4	0.129	9/16 Hex	1 5/16	0.82	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	90°	98°	109°	125°	136°	144°	
1/4FL18	1/4	0.147	9/16 Hex	1 5/16	0.99	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	104°	113°	118°	124°	134°	138°	
1/4FL20	1/4	0.154	9/16 Hex	1 5/16	1.10	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	110°	119°	127°	131°	136°	144°	
1/4FL22	1/4	0.161	9/16 Hex	1 5/16	1.20	1.56	1.84	2.2	2.7	3.1	3.8	4.4	5.4	97°	108°	114°	120°	128°	132°	
1/4FL24	1/4	0.169	9/16 Hex	1 5/16	1.31	1.70	2.0	2.4	2.9	3.4	4.2	4.8	5.9	106°	118°	121°	127°	136°	154°	
1/4FL27	1/4	0.177	9/16 Hex	1 5/16	1.48	1.91	2.3	2.7	3.3	3.8	4.7	5.4	6.6	110°	120°	124°	129°	139°	146°	
3/8FL30	3/8	0.188	1 1/16 Hex	1 1/2	1.64	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	104°	116°	121°	127°	135°	138°	
3/8FL35	3/8	0.196	1 1/16 Hex	1 1/2	1.92	2.5	2.9	3.5	4.3	4.9	6.1	7.0	8.6	104°	114°	118°	126°	130°	137°	
3/8FL40	3/8	0.209	1 1/16 Hex	1 1/2	2.2	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	109°	115°	123°	126°	135°	136°	
3/8FL45	3/8	0.228	1 1/16 Hex	1 1/2	2.5	3.2	3.8	4.5	5.5	6.4	7.8	9.0	11.0	117°	126°	134°	139°	142°	144°	

All references to G.P.M. mean U.S. G.P.M.

See pages 2, 3 and 4 for engineering data and spray coverage.

MODEL NUMBER	PIPE SIZE NPT	ORIFICE DIA. (inches)	DIMENSIONS		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @					
			A	L	3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	3 psi	5 psi	7 psi	10 psi	20 psi	60 psi	
1/2FL40	1/2	0.209	7/8 Hex	1 11/16	2.2	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	106°	111°	119°	124°	129°	133°	
1/2FL50	1/2	0.242	7/8 Hex	1 11/16	2.7	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	106°	122°	130°	133°	139°	141°	
1/2FL60	1/2	0.266	7/8 Hex	2	3.3	4.2	5.0	6.0	7.3	8.5	10.4	12.0	14.7	110°	120°	124°	128°	133°	138°	
1/2FL70	1/2	0.290	7/8 Hex	2	3.8	4.9	5.9	7.0	8.6	9.9	12.1	14.0	17.1	105°	118°	119°	121°	124°	130°	
1/2FL80	1/2	0.312	7/8 Hex	2	4.4	5.7	6.7	8.0	9.8	11.3	13.9	16.0	19.6	114°	116°	124°	126°	130°	135°	
3/4FL90	3/4	0.316	1 1/16 Hex	2 3/8	4.9	6.4	7.5	9.0	11.0	12.7	15.6	18.0	22	104°	115°	120°	121°	125°	128°	
3/4FL100	3/4	0.344	1 1/16 Hex	2 3/8	5.5	7.1	8.4	10.0	12.2	14.1	17.3	20	24	105°	113°	115°	118°	121°	125°	
3/4FL110	3/4	0.348	1 1/16 Hex	2 3/8	6.0	7.8	9.2	11.0	13.5	15.6	19.1	22	27	106°	110°	116°	119°	120°	121°	
3/4FL120	3/4	0.375	1 1/16 Hex	2 3/8	6.6	8.5	10.0	12.0	14.7	17.0	21	24	29	119°	125°	129°	131°	133°	135°	
3/4FL140	3/4	0.402	1 1/4 Hex	2 5/8	7.7	9.9	11.7	14.0	17.1	19.8	24	28	34	115°	120°	128°	133°	137°	139°	
3/4FL160	3/4	0.430	1 1/4 Hex	2 5/8	8.8	11.3	13.4	16.0	19.6	23	28	32	39	117°	122°	130°	133°	139°	140°	
3/4FL180	3/4	0.460	1 1/2 Hex	2 5/8	9.9	12.7	15.1	18.0	22	25	31	36	44	117°	128°	131°	133°	136°	136°	
3/4FL210	3/4	0.500	1 1/2 Hex	2 5/8	11.5	14.8	17.6	21	26	30	36	42	51	122°	127°	132°	135°	136°	136°	
1FL140	1	0.402	1 1/2 Hex	2 13/16	7.7	9.9	11.7	14.0	17.1	20	24	28	34	117°	122°	126°	130°	133°	133°	
1FL160	1	0.430	1 1/2 Hex	2 13/16	8.8	11.3	13.4	16.0	20	23	28	32	39	117°	127°	131°	135°	136°	136°	
1FL180	1	0.460	1 1/2 Hex	2 13/16	9.9	12.7	15.1	18.0	22	25	31	36	44	115°	125°	128°	132°	135°	135°	
1FL210	1	0.500	1 1/2 Hex	2 13/16	11.5	14.8	17.6	21	26	30	36	42	51	117°	122°	127°	130°	133°	134°	
1FL300	1	0.578	3/4 Hex	3 3/8	16.4	21	25	30	37	42	52	60	73	114°	118°	120°	123°	124°	124°	
1FL450	1	0.704	3/4 Hex	3 3/8	25	32	38	45	55	64	78	90	110	128°	135°	139°	142°	144°	144°	

All references to G.P.M. mean U.S. G.P.M.

FLAT SPRAY

Flooding nozzles for air and steam applications

FL SERIES

SPRAY CHARACTERISTICS:

The FL series spray nozzles may also be used with air or steam, resulting in a deflected curtain of gas extending no more than a few inches away from the nozzle. For most applications, the maximum practical target distance from the nozzle is 10 inches.

CONSTRUCTION:

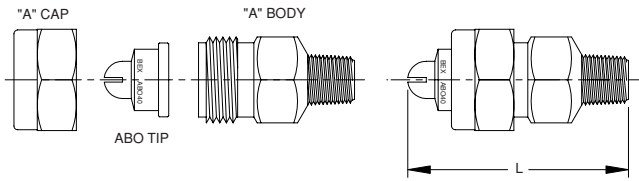
The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models are also available in other materials, such as PVC, CPVC, Teflon® and polypropylene.

TYPICAL APPLICATIONS:

For dispensing air or steam. Stainless steel construction recommended for steam applications.

- Cleaning
- Cooling
- Blow-off of surfaces

MODEL NUMBER			ORIFICE DIA. (inches)	AIR CAPACITY (SCFM)					STEAM CAPACITY (Lbs/Hr)					COVERAGE AT 6" DISTANCE FROM THE NOZZLE (inches)	
1/8 Pipe Size	1/4 Pipe Size	3/8 Pipe size		10 psi	20 psi	40 psi	50 psi	80 psi	10 psi	20 psi	40 psi	50 psi	80 psi	10 psi	15 psi
1/8FL.25			.017	0.10	0.14	0.22	0.26	0.38	0.27	0.38	0.60	0.71	1.04	2	4 1/2
1/8FL.50			.024	0.19	0.27	0.43	0.50	0.74	0.56	0.79	1.25	1.47	2.2	2	5
1/8FL.75			.029	0.28	0.39	0.61	0.73	1.06	0.83	1.17	1.84	2.2	3.2	2 1/2	6
1/8FL1			.033	0.36	0.51	0.80	0.95	1.39	1.09	1.52	2.4	2.8	4.1	3	6
1/8FL1.3	1/4FL1.3		.038	0.48	0.68	1.07	1.27	1.86	1.46	2.0	3.2	3.7	5.5	3	6 1/2
1/8FL1.5	1/4FL1.5		.042	0.58	0.83	1.31	1.55	2.3	1.79	2.5	3.9	4.7	6.8	3 1/2	6 1/2
1/8FL2	1/4FL2		.047	0.73	1.03	1.62	1.92	2.8	2.3	3.2	5.0	6.0	8.7	3 1/2	7 1/2
1/8FL2.5	1/4FL2.5		.055	1.00	1.42	2.2	2.6	3.9	3.1	4.4	6.9	8.2	12.0	4	7 1/2
1/8FL3	1/4FL3		.059	1.15	1.63	2.6	3.0	4.4	3.6	5.0	7.9	9.3	13.6	5	8
1/8FL4	1/4FL4		.070	1.61	2.3	3.6	4.3	6.3	5.1	7.2	11.3	13.4	19.6	5	9
1/8FL5	1/4FL5		.076	1.90	2.7	4.3	5.0	7.4	6.0	8.5	13.4	15.8	23	6	10
1/8FL7.5	1/4FL7.5		.094	2.91	4.2	6.6	7.8	11.5	9.3	13.1	21	24	36	6 1/2	10
1/8FL10	1/4FL10		.110	3.99	5.7	9.0	10.6	15.6	12.8	17.9	28	33	49	7	11
1/8FL12	1/4FL12		.120	4.7	6.8	10.7	12.7	18.6	15.3	21	33	39	57	7	11 1/2
1/8FL15	1/4FL15		.129	5.5	8.4	13.2	15.7	23	18.8	26	41	48	71	7	12
1/8FL18	1/4FL18		.147	7.1	10.3	16.2	19.2	28	23	32	50	60	87	8	13
1/8FL20	1/4FL20		.154	7.8	11.3	17.8	21	31	25	35	55	65	96	8 1/2	14 1/2
	1/4FL22		.161	8.5	12.3	19.4	23	34	28	39	61	73	106	8 1/2	14 1/2
	1/4FL24		.169	9.4	13.6	21	25	37	31	43	68	80	117	8 1/2	15
	1/4FL27		.177	10.3	14.9	23	28	41	34	47	74	88	128	8 1/2	15
	3/8FL30		.188	11.6	16.8	26	31	46	38	53	84	99	145	8 1/2	15 1/2



FLAT SPRAY

SPRAY CHARACTERISTICS:

ABO Series air blow-off nozzles project a flat fan-shaped curtain of gas in a direction parallel to the axis of the nozzle body. Gases most commonly used are air and steam. ABO nozzles are designed with large maximum free passage sizes to reduce clogging and minimize the effects of minor tip damage.

CONSTRUCTION:

ABO assemblies comprise a body, a retaining cap and a nozzle tip. Standard materials are brass, 303 stainless steel and 316 stainless steel. Other materials are available on request.

SPECIAL FEATURES:

- Large maximum free passage
- Wider, more uniform coverage
- Easy assembly/disassembly and cleaning

TYPICAL APPLICATIONS:

- Cooling of Components/Parts
- Debris Removal
- Cleaning and Drying of Parts
- Small Gas Curtains

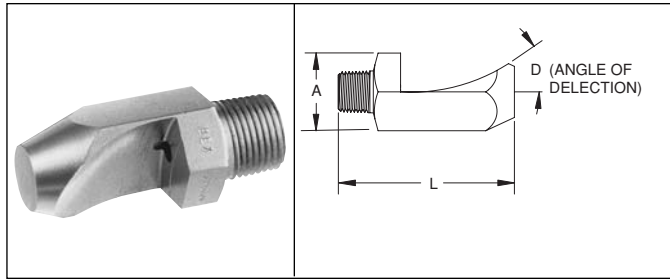
DIMENSIONS

MODEL NUMBER	PIPE SIZE (NPT)	OVERALL LENGTH (L)
1/8 ABO	1/8	1.77
1/4 ABO	1/4	1.83
3/8 ABO	3/8	1.90

MODEL NUMBER	SLOT WIDTH (inches)	AIR CAPACITY (S.C.F.M.)				STEAM CAPACITY (lbs/hr)				DISTANCE FROM NOZZLE (inches)	APPROX. WIDTH OF AIR COVERAGE (inches)							
		10 psi	20 psi	60 psi	100 psi	10 psi	20 psi	60 psi	100 psi		5 psi	10 psi	20 psi	40 psi	60 psi	80 psi	100 psi	
ABO16	0.016	0.67	1.10	2.4	3.6	1.20	2.3	5.0	7.6	2	5	5	6	8	9	10	10	
										4	7	8	9	12	14	16	16	
										6	9	10	11	16	19	22	23	
										10	10	13	15	21	25	28	29	
										20	12	16	20	32	35	39	40	
ABO20	0.020	1.40	2.0	4.3	6.6	2.9	4.5	9.7	14.9	2	5	6	7	9	10	11	11	
										4	8	10	12	13	16	17	17	
										6	10	13	16	18	21	24	24	
										10	15	20	24	25	29	30	30	
										20	24	28	31	33	38	41	42	
ABO28	0.028	2.3	3.5	7.5	11.6	5.0	7.9	17.0	26	2	6	6	6	9	11	12	14	
										4	8	9	9	14	16	18	23	
										6	10	12	12	18	21	25	29	
										10	15	17	18	26	29	34	37	
										20	24	29	30	38	44	48	51	
ABO40	0.040	4.2	6.0	12.9	19.8	9.0	13.0	28	43	2	7	8	8	11	11	12	12	
										4	11	11	12	17	18	22	22	
										6	13	13	16	23	24	29	30	
										10	15	17	23	31	32	38	42	
										20	22	28	40	45	46	50	55	
ABO51	0.051	7.1	11.0	24	36	16.0	24	52	79	2	87	9	10	13	14	16	23	
										4	12	15	16	21	24	28	32	
										6	16	20	22	28	34	38	43	
										10	24	29	30	40	46	49	53	
										20	36	41	43	55	62	62	63	
ABO72	0.072	13.0	19.0	41	63	27	43	93	142	2	7	9	12	16	20	22	23	
										4	11	13	15	25	22	36	37	
										6	14	17	19	34	41	45	47	
										10	20	24	26	45	55	49	62	
										20	33	39	41	55	70	74	76	

High impact flat spray nozzles

FP SERIES



SPRAY CHARACTERISTICS:

A flat and thin fan-shaped spray with sharp definition on all edges. This spray delivers very high impact over the area covered. The spray is deflected by angle D away from the centerline of the spray nozzle.

CONSTRUCTION:

The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel.

TYPICAL APPLICATIONS:

- High Impact Applications
- Metal Wash
- Gravel Washing
- Vehicle Washing

FLAT SPRAY

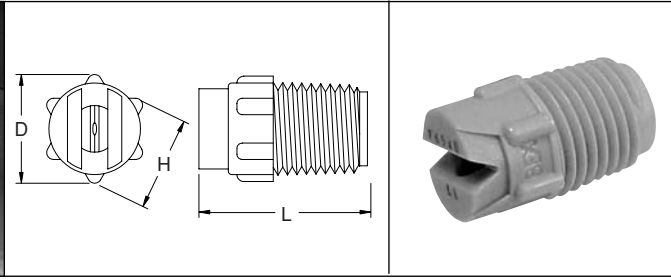
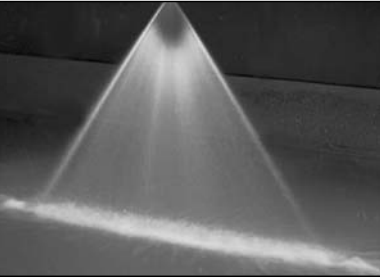
SPRAY ANGLE @ 40psi	MODEL NUMBER	PIPE SIZE NPT	ORIFICE DIA. (inches)	ANGLE 'D' @ 40psi	Dimensions (inches)		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @		
					'A'	'L'	15	20	30	40	60	80	100	150	15	40	100		
							psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi		
50°	1/8FP5001	1/8	0.024	40°	1/2 Hex	27/32	0.06	0.07	0.09	0.10	0.12	0.14	0.16	0.19	30°	50°	58°		
	1/4FP50025	1/4	0.038	41°	11/16 Hex	13/64	0.15	0.18	0.22	0.25	0.31	0.35	0.40	0.48	29°	50°	57°		
	1/4FP5005	1/4	0.053	41°	11/16 Hex	11/8	0.31	0.35	0.43	0.50	0.61	0.71	0.79	0.97	30°	50°	59°		
	1/4FP5010	1/4	0.075	52°	11/16 Hex	11/4	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	32°	50°	59°		
	1/4FP5025	1/4	0.118	40°	11/16 Hex	15/16	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.8	41°	50°	58°		
	3/8FP5025	3/8	0.118	40°	11/16 Hex	13/8	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.8	41°	50°	58°		
	1/4FP5040	1/4	0.149	45°	7/8 Hex	17/8	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	42°	50°	59°		
	3/8FP5040	3/8	0.149	44°	7/8 Hex	129/32	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	40°	50°	59°		
	3/8FP5060	3/8	0.183	40°	7/8 Hex	23/16	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	41°	50°	52°		
	3/8FP50100	3/8	0.236	38°	11/4 Hex	23/4	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	44°	50°	54°		
3/8FP50125	3/8	0.266	34°	11/4 Hex	25/8	7.7	8.8	10.8	12.5	15.3	17.7	19.8	24	39°	50°	57°			
3/8FP50160	3/8	0.298	37°	11/4 Hex	211/16	9.8	11.3	13.9	16.0	19.6	23	25	31	46°	50°	55°			
3/8FP50200	3/8	0.328	33°	13/8 Hex	27/8	12.2	14.1	17.3	20	24	28	32	39	47°	50°	55°			
40°	3/8FP4040	3/8	0.149	34°	7/8 Hex	23/32	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	29°	40°	48°		
	3/8FP4050	3/8	0.167	32°	11/4 Hex	29/16	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	30°	40°	47°		
	3/8FP4060	3/8	0.183	31°	11/8 Hex	227/32	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	31°	40°	50°		
	3/8FP4070	3/8	0.197	28°	11/4 Hex	215/16	4.3	4.9	6.1	7.0	8.6	9.9	11.1	13.6	33°	40°	50°		
	3/8FP4080	3/8	0.211	28°	11/4 Hex	215/16	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	33°	40°	48°		
	3/8FP4090	3/8	0.228	28°	11/4 Hex	215/16	5.5	6.4	7.8	9.0	11.0	12.7	14.2	17.4	34°	40°	46°		
	3/8FP40100	3/8	0.236	31°	11/4 Hex	31/8	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	34°	40°	46°		
	35°	1/8FP3504	1/8	0.047	36°	7/16 Hex	15/16	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.77	20°	35°	41°	
1/4FP3510		1/4	0.075	37°	11/16 Hex	17/16	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	18°	35°	38°		
1/4FP3520		1/4	0.105	30°	11/16 Hex	19/16	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	25°	35°	42°		
3/8FP3520		3/8	0.105	32°	11/16 Hex	15/8	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	25°	35°	41°		
3/8FP3525		3/8	0.117	29°	11/16 Hex	123/32	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.8	24°	35°	41°		
3/8FP3530		3/8	0.128	28°	7/8 Hex	21/8	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	25°	35°	42°		
3/8FP3540		3/8	0.149	31°	7/8 Hex	211/32	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	29°	35°	42°		
3/8FP3550		3/8	0.167	26°	1 Hex	25/8	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	30°	35°	40°		
1/2FP3560		1/2	0.183	29°	11/16 Hex	27/8	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	27°	35°	40°		
1/2FP3580		1/2	0.211	22°	11/4 Hex	31/2	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	25°	35°	38°		
1/2FP35100	1/2	0.221	24°	11/4 Hex	31/2	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	25°	35°	40°			
3/4FP35160	3/4	0.295	22°	11/4 Hex	413/32	9.8	11.3	13.9	16.0	19.6	23	25	31	26°	35°	39°			
3/4FP35200	3/4	0.328	24°	11/4 Hex	411/32	12.2	14.1	17.3	20	24	28	32	39	31°	35°	42°			
25°	1/4FP2540	1/4	0.149	24°	7/8 Hex	21/2	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	22°	25°	27°		
15°	1/4FP1510	1/4	0.075	22°	11/16 Hex	115/16	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	--	15°	21°		
	1/4FP1520	1/4	0.105	16°	11/16 Hex	21/4	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	--	15°	18°		
	3/8FP1530	3/8	0.129	20°	7/8 Hex	227/32	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	8°	15°	24°		
	3/8FP1540	3/8	0.149	13°	7/8 Hex	33/4	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	8°	15°	20°		
	3/8FP1550	3/8	0.167	14°	7/8 Hex	35/8	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	8°	15°	22°		
	1/2FP1560	1/2	0.183	14°	1 Hex	415/16	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	11°	15°	18°		
	1/2FP1580	1/2	0.218	14°	11/8 Hex	51/8	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	11°	15°	18°		
	1/2FP15100	1/2	0.236	15°	11/8 Hex	57/16	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	11°	15°	17°		
	3/4FP15200	3/4	0.333	15°	11/2 Hex	79/16	12.2	14.1	17.3	20	24	28	32	39	11°	15°	17°		
	3/4FP15300	3/4	0.408	15°	13/4 Hex	71/2	18.4	21	26	30	37	42	47	58	12°	15°	18°		

'--' means not recommended at this pressure

All references to G.P.M. mean U.S. G.P.M.

F SERIES

Molded plastic spray nozzles



DIMENSIONS

NOZZLE TYPE	Dim. D	Dim. H	Dim. L
1/8F	0.62	9/16	0.8
1/4F	0.62	9/16	1.0
3/8F	0.77	11/16	1.0

SPRAY CHARACTERISTICS:

BEX F series spray nozzles produce a flat spray pattern with spray angles of 0° to 110° @ 40 psi.

CONSTRUCTION:

Each BEX molded nozzle is designed with a series of "knobs" which makes them easier to finger tighten than a hex, especially when wet. The design feature of a small starter barrel greatly reduces the tendency to strip or cross-thread the nozzle during the installation.

MATERIALS AVAILABLE:

ACETAL - (Yellow) suitable for most aqueous solutions (ph 4-9) up to 180°F.
 POLYPROPYLENE - (Green) excellent chemical and corrosion resistance. Useful up to 175°F.
 NATURAL POLYPROPYLENE - non-pigmented for optimum purity.
 PVDF - (Red) excellent durability and abrasion resistance and is inert to most chemicals. Many applications useful up to 300°F.
 NATURAL PVDF - non-pigmented for optimum purity.

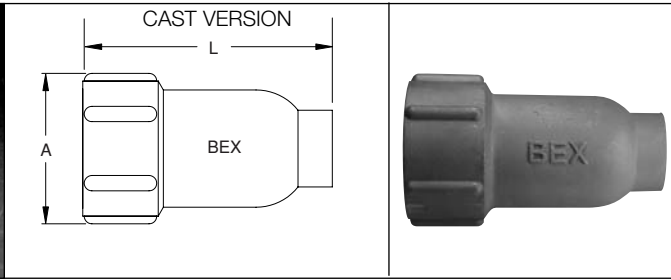
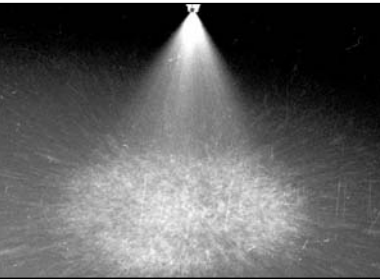
TYPICAL APPLICATIONS:

- Printed Circuit Board Washing
- PCB-Etching/Developing
- Semiconductor Manufacturing
- Pressure Washers
- Car Washing
- Street Sweeping
- Carpet Cleaning
- Fruit and Vegetable Washing
- Plating Processes
- Dust Suppression
- Acid Spraying
- Degreasing
- Coating Applications
- Foam Control
- Metal Washing
- Chemical Spraying
- Rinsing Parts

	SPRAY ANGLES @ 40 psi									CAPACITY (GPM)		
	0°	15°	25°	40°	50°	65°	80°	95°	110°	@10 psi	@40 psi	
1/8" MODELS	1/8F0002	1/8F1502	1/8F2502	1/8F4002	1/8F5002	1/8F6502	1/8F8002	1/8F9502	1/8F11002	0.10	0.2	
	1/8F0025	1/8F1525	1/8F2525	1/8F4025	1/8F5025	1/8F6525	1/8F8025	1/8F9525	1/8F11025	0.13	0.25	
	1/8F0003	1/8F1503	1/8F2503	1/8F4003	1/8F5003	1/8F6503	1/8F8003	1/8F9503	1/8F11003	0.15	0.3	
	1/8F0004	1/8F1504	1/8F2504	1/8F4004	1/8F5004	1/8F6504	1/8F8004	1/8F9504	1/8F11004	0.20	0.4	
	1/8F0005	1/8F1505	1/8F2505	1/8F4005	1/8F5005	1/8F6505	1/8F8005	1/8F9505	1/8F11005	0.25	0.5	
	1/8F0006	1/8F1506	1/8F2506	1/8F4006	1/8F5006	1/8F6506	1/8F8006	1/8F9506	1/8F11006	0.30	0.6	
	1/8F0007	1/8F1507	1/8F2507	1/8F4007	1/8F5007	1/8F6507	1/8F8007	1/8F9507	1/8F11007	0.35	0.7	
	1/8F0008	1/8F1508	1/8F2508	1/8F4008	1/8F5008	1/8F6508	1/8F8008	1/8F9508	1/8F11008	0.40	0.8	
	1/8F0010	1/8F1510	1/8F2510	1/8F4010	1/8F5010	1/8F6510	1/8F8010	1/8F9510	1/8F11010	0.50	1.0	
	1/8F0015	1/8F1515	1/8F2515	1/8F4015	1/8F5015	1/8F6515	1/8F8015	1/8F9515	1/8F11015	0.75	1.5	
	1/8F0020	1/8F1520	1/8F2520	1/8F4020	1/8F5020	1/8F6520	1/8F8020	1/8F9520	1/8F11020	1.00	2.0	
	1/4" MODELS	1/4F0002	1/4F1502	1/4F2502	1/4F4002	1/4F5002	1/4F6502	1/4F8002	1/4F9502	1/4F11002	0.10	0.2
		1/4F0003	1/4F1503	1/4F2503	1/4F4003	1/4F5003	1/4F6503	1/4F8003	1/4F9503	1/4F11003	0.15	0.3
		1/4F0004	1/4F1504	1/4F2504	1/4F4004	1/4F5004	1/4F6504	1/4F8004	1/4F9504	1/4F11004	0.20	0.4
		1/4F0005	1/4F1505	1/4F2505	1/4F4005	1/4F5005	1/4F6505	1/4F8005	1/4F9505	1/4F11005	0.25	0.5
		1/4F0006	1/4F1506	1/4F2506	1/4F4006	1/4F5006	1/4F6506	1/4F8006	1/4F9506	1/4F11006	0.30	0.6
1/4F0008		1/4F1508	1/4F2508	1/4F4008	1/4F5008	1/4F6508	1/4F8008	1/4F9508	1/4F11008	0.40	0.8	
1/4F0010		1/4F1510	1/4F2510	1/4F4010	1/4F5010	1/4F6510	1/4F8010	1/4F9510	1/4F11010	0.50	1.0	
1/4F0015		1/4F1515	1/4F2515	1/4F4015	1/4F5015	1/4F6515	1/4F8015	1/4F9515	1/4F11015	0.75	1.5	
1/4F0020		1/4F1520	1/4F2520	1/4F4020	1/4F5020	1/4F6520	1/4F8020	1/4F9520	1/4F11020	1.00	2.0	
1/4F0030		1/4F1530	1/4F2530	1/4F4030	1/4F5030	1/4F6530	1/4F8030	1/4F9530	1/4F11030	1.50	3.0	
1/4F0040		1/4F1540	1/4F2540	1/4F4040	1/4F5040	1/4F6540	1/4F8040	1/4F9540	1/4F11040	2.00	4.0	
1/4F0050		1/4F1550	1/4F2550	1/4F4050	1/4F5050	1/4F6550	1/4F8050	1/4F9550	1/4F11050	2.50	5.0	
1/4F0060		1/4F1560	1/4F2560	1/4F4060	1/4F5060	1/4F6560	1/4F8060	1/4F9560	1/4F11060	3.00	6.0	
1/4F0070		1/4F1570	1/4F2570	1/4F4070	1/4F5070	1/4F6570	1/4F8070	1/4F9570	1/4F11070	3.50	7.0	
3/8" MODELS		3/8F0010	3/8F1510	3/8F2510	3/8F4010	3/8F5010	3/8F6510	3/8F8010	3/8F9510	3/8F11010	0.50	1.0
		3/8F0015	3/8F1515	3/8F2515	3/8F4015	3/8F5015	3/8F6515	3/8F8015	3/8F9515	3/8F11015	0.75	1.5
	3/8F0020	3/8F1520	3/8F2520	3/8F4020	3/8F5020	3/8F6520	3/8F8020	3/8F9520	3/8F11020	1.00	2.0	
	3/8F0030	3/8F1530	3/8F2530	3/8F4030	3/8F5030	3/8F6530	3/8F8030	3/8F9530	3/8F11030	1.50	3.0	
	3/8F0040	3/8F1540	3/8F2540	3/8F4040	3/8F5040	3/8F6540	3/8F8040	3/8F9540	3/8F11040	2.00	4.0	
	3/8F0050	3/8F1550	3/8F2550	3/8F4050	3/8F5050	3/8F6550	3/8F8050	3/8F9550	3/8F11050	2.50	5.0	
	3/8F0060	3/8F1560	3/8F2560	3/8F4060	3/8F5060	3/8F6560	3/8F8060	3/8F9560	3/8F11060	3.00	6.0	
	3/8F0070	3/8F1570	3/8F2570	3/8F4070	3/8F5070	3/8F6570	3/8F8070	3/8F9570	3/8F11070	3.50	7.0	

All references to G.P.M. mean U.S. G.P.M.

See pages 2, 3 and 4 for engineering data and spray coverage.



DIMENSIONS

FEMALE FPS	Dim. L	Dim. A	MALE PS	Dim. L	Dim. A
1 1/4 FPS	3 1/4	2	1 1/4 PS	3	1 3/4
1 1/2 FPS	4 1/4	2 1/2	1 1/2 PS	4	2
2 FPS	5 7/8	3	2 PS	5 5/8	2 1/2
2 1/2 FPS	5 7/8	3 1/2	2 1/2 PS	5 5/8	4
3 FPS	5 7/8	4	3 PS	5 1/2	3 1/2

SPRAY CHARACTERISTICS:

Full cone spray pattern, with uniform distribution throughout the cone.

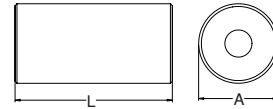
CONSTRUCTION:

All models have a female NPT connection, and consist of a one piece body plus an internal insert. Standard materials are machined 316 stainless steel or cast 316 stainless steel.

TYPICAL APPLICATIONS:

- Chemical Processing
- Cooling Sprays
- Foam Breaking
- Heat Exchanger Cooling
- Coke Quenching
- Absorption Stack Spraying
- Gravel Washing

MACHINED VERSION



3" and 4" machined from bar.

FULL CONE SPRAY

'FS' FEMALE	PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY ANGLE @		
			3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi
1 1/4 FS7.1	1 1/4	0.260	3.9	5.0	5.9	7.1	8.7	10.0	12.3	14.2	17.4	20	22	27	54°	56°	50°
1 1/4 FS12	1 1/4	0.260	6.6	8.5	10.0	12.0	14.7	17.0	21	24	29	34	38	46	72°	76°	70°
1 1/4 FS14.1	1 1/4	0.260	7.7	10.0	11.8	14.1	17.3	19.9	24	28	35	40	45	55	76°	80°	74°
1 1/4 FS16.5	1 1/4	0.305	9.0	11.7	13.8	16.5	20	23	29	33	40	47	52	64	85°	90°	83°
1 1/4 FS23.8	1 1/4	0.312	13.1	17.0	20	24	29	34	42	48	59	68	76	93	94°	98°	89°
1 1/2 FS12.5	1 1/2	0.315	6.8	8.8	10.5	12.5	15.3	17.7	22	25	31	35	40	48	50°	51°	49°
1 1/2 FS19	1 1/2	0.329	10.4	13.4	15.9	19.0	23	27	33	38	47	54	60	74	68°	70°	62°
1 1/2 FS24	1 1/2	0.329	13.1	17.0	20	24	29	34	42	48	59	68	76	93	82°	88°	70°
1 1/2 FS36	1 1/2	0.375	19.7	25	30	36	44	51	62	72	88	102	114	139	98°	103°	85°
2 FS20	2	0.438	11.0	14.1	16.7	20	24	28	35	40	49	57	63	77	50°	64°	60°
2 FS36	2	0.438	19.7	25	30	36	44	51	62	72	88	102	114	139	70°	75°	68°
2 FS42	2	0.438	23	30	35	42	51	59	73	84	103	119	133	163	74°	78°	70°
2 FS47	2	0.438	26	33	39	47	58	66	81	94	115	133	149	182	78°	80°	84°
2 FS7.1	2	0.438	32	42	49	59	72	83	102	118	145	167	187	229	82°	86°	78°
2 FS71	2	0.438	39	50	59	71	87	100	123	142	174	201	225	275	98°	100°	93°
2 1/2 FS30	2 1/2	0.438	16	21	25	30	37	42	52	60	73	85	95	116	55°	59°	55°
2 1/2 FS59	2 1/2	0.438	32	42	49	59	72	83	102	118	145	167	187	229	75°	80°	72°
2 1/2 FS71	2 1/2	0.531	39	50	59	71	87	100	123	142	174	201	225	275	80°	85°	77°
2 1/2 FS83	2 1/2	0.531	45	59	69	83	102	117	144	166	203	235	262	321	80°	82°	76°
2 1/2 FS95	2 1/2	0.531	52	67	79	95	116	134	165	190	233	269	300	368	86°	90°	82°
2 1/2 FS108	2 1/2	0.688	59	76	90	108	132	153	187	216	265	305	342	418	96°	98°	86°
3 FS50	3	0.688	27	35	42	50	61	71	87	100	122	141	158	194	49°	50°	46°
3 FS95	3	0.688	52	67	79	95	116	134	165	190	233	269	300	368	81°	84°	76°
3 FS108	3	0.688	59	76	90	108	132	153	187	216	265	305	342	418	86°	89°	81°
3 FS119	3	0.688	65	84	100	119	146	168	206	238	291	337	376	461	92°	95°	87°
3 FS142	3	0.688	78	100	119	142	174	201	246	284	348	402	449	550	102°	105°	93°
4 FS189	4	0.875	104	134	158	189	231	267	327	378	463	535	598	732	87°	90°	85°
4 FS212	4	0.875	116	150	177	212	260	300	367	424	519	600	670	821	92°	95°	87°
4 FS238	4	0.875	130	168	199	238	291	337	412	476	583	673	753	922	97°	100°	91°
4 FS250	4	0.875	137	177	209	250	306	354	433	500	612	707	791	968	102°	105°	95°

All references to G.P.M. mean U.S. G.P.M.

Wide angle full cone spray nozzles

SW SERIES

SPRAY CHARACTERISTICS:

A wide angle full cone spray pattern, with uniform distribution throughout the cone.

CONSTRUCTION:

This nozzle contains a patented insert with larger flow passages than older styles, and is less susceptible to clogging. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models are also stocked in PVC,

C PVC and polypropylene.

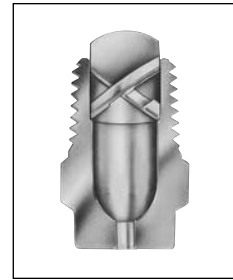
For molded plastic models, please see page 29.

TYPICAL APPLICATIONS:

Anywhere a wide angle full cone spray is required:

- Chemical Processing
- Cooling Sprays
- Continuous Casting

U.S. Patent No. 4,142,682
Canadian Patent No. 1,050,589

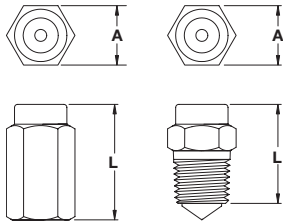


SW SERIES

One piece body + non-removable insert

DIMENSIONS

MALE SW	Dim. A	Dim. L	FEMALE SW	Dim. A	Dim. L
1/8 SW	7/16 HEX	1 1/16	3/4 FSW	1 1/4 HEX	2 1/4
1/4 SW	7/8 HEX	1 1/2	1 FSW	1 1/2 HEX	2 1/2
3/8 SW	1 1/8 HEX	1 7/8	1 1/2 FSW	2 HEX	3 1/2
1/2 SW	1 1/4 HEX	2 1/8	2 FSW	2 1/2 Dia.	4 1/4
3/4 SW	1 3/8 HEX	2 3/8	2 1/2 FSW	3 1/2 Dia.	5 1/4
1 SW	1 7/8 dia.	2 7/8	3 FSW	4" Dia.	7 1/4
			4 FSW	5" Dia.	10 1/2

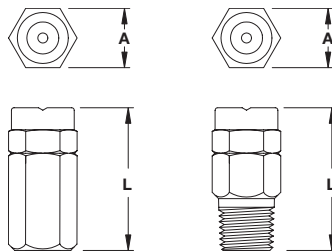


GSW SERIES

Two piece body + removable insert

DIMENSIONS

NOZZLE SIZE	Dim. A	Dim. L
1/8 GSW	5/16 HEX	1 1/16
1/4 GSW	11/16 HEX	1 9/16
3/8 GSW	1 1/8 HEX	1 11/16
1/2 GSW	1 HEX	2
1/4 FGSW	5/8 HEX	1 9/32
1/2 FGSW	1 1/8 HEX	1 21/32
3/4 FGSW	1 1/4 HEX	1 15/16
1 FGSW	1 HEX	2 3/32



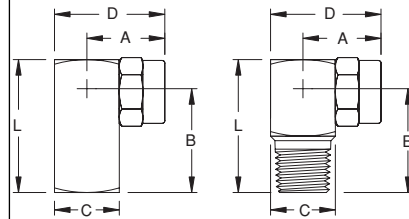
HGSW SERIES

Two piece body + removable insert.

Sprays at right angle to pipe.

DIMENSIONS

NOZZLE SIZE	Dim. A	Dim. B	Dim. C	Dim. D	Dim. L
1/8 HGSW	29/32	1 1/16	5/8 SQ	1 1/32	1
1/4 HGSW	29/32	1	3/4 SQ	1 9/32	1 3/8
3/8 HGSW	1 1/32	1 1/8	7/8 SQ	1 19/32	1 17/32
1/2 HGSW	1 1/8	1 3/8	1 SQ	1 11/16	1 7/8
1/4 FHGSW	2 1/32	1 1/8	5/8 SQ	2 9/32	3 1/32
1/2 FHGSW	2 1/32	1	3/4 SQ	2 9/32	3 1/8
3/4 FHGSW	1 1/32	1 3/8	7/8 SQ	1 19/32	1 17/32
1 FHGSW	1 1/8	1 3/8	1 SQ	1 11/16	1 7/8

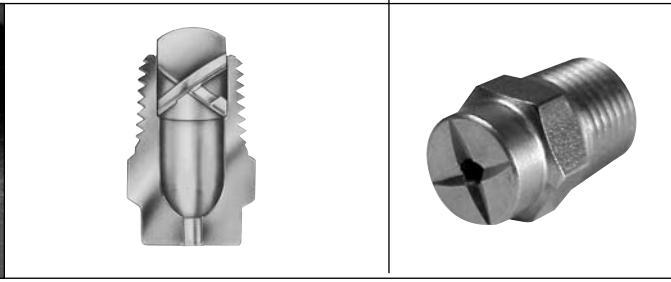


FULL CONE SPRAY

'SW' one piece body		'GSW' two piece body		'HGSW' right angle, two piece body		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												Spray Angle @																																																																															
FEMALE	MALE	FEMALE	MALE	FEMALE	MALE			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi																																																																														
1/8S2.8W	1/8FGS2.8W	1/8GS2.8W	1/8FSGS2.8W	1/8S4.3W	1/8FGS4.3W	1/8GS4.3W	1/8FSGS4.3W	1/8S5.6W	1/8FGS5.6W	1/8GS5.6W	1/8FSGS5.6W	1/8S8W	1/8FGS8W	1/8GS8W	1/8FSGS8W	1/4S5.6W	1/4FGS5.6W	1/4GS5.6W	1/4FSGS5.6W	1/4S10W	1/4FGS10W	1/4GS10W	1/4FSGS10W	1/4S12W	1/4FGS12W	1/4GS12W	1/4FSGS12W	1/4S14W	1/4FGS14W	1/4GS14W	1/4FSGS14W	3/8S17W	3/8FGS17W	3/8GS17W	3/8FSGS17W	3/8S20W	3/8FGS20W	3/8GS20W	3/8FSGS20W	3/8S24W	3/8FGS24W	3/8GS24W	3/8FSGS24W	3/8S27W	3/8FGS27W	3/8GS27W	3/8FSGS27W	1/2S30W	1/2FGS30W	1/2GS30W	1/2FSGS30W	1/2S35W	1/2FGS35W	1/2GS35W	1/2FSGS35W	1/2S40W	1/2FGS40W	1/2GS40W	1/2FSGS40W	1/2S45W	1/2FGS45W	1/2GS45W	1/2FSGS45W	3/4FS50W	3/4S50W			3/4FS71W	3/4S71W			1FS13W	1S13W			1 1/4FS19W				1 1/2FS29W				2FS56W				2 1/2FS83W				3FS107W				4FS165W			

SQ SERIES

Full square spray nozzles



-SPRAY CHARACTERISTICS:

Full cone spray pattern, with uniform distribution throughout the approximately square cone.

CONSTRUCTION:

Standard materials are brass, 303 and 316 stainless. Larger sizes in cast 316 or 303 stainless bar. Some models are also stocked in plastics and other materials.

Please see page 29 for molded plastic models.

TYPICAL APPLICATIONS:

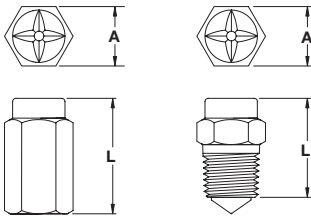
- Chemical Processing
- Cooling Sprays
- Continuous Casting

SQ SERIES

One piece body + removable insert

DIMENSIONS

NOZZLE SIZE	Dim. A	Dim. L
1/8GSQ	5/16 HEX	1 5/16
1/4GSQ	11/16 HEX	1 9/16
3/8GSQ	13/16 HEX	1 11/16
1/2GSQ	1 HEX	2
1/8FGSQ	5/16 HEX	1 9/32
1/4FGSQ	11/16 HEX	1 21/32
3/8FGSQ	13/16 HEX	1 15/16
1/2FGSQ	1 HEX	2 2/32

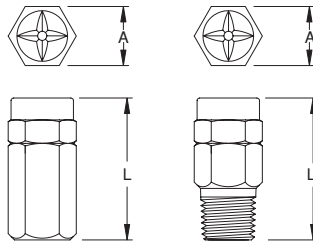


GSQ SERIES

Two piece body + removable insert

DIMENSIONS

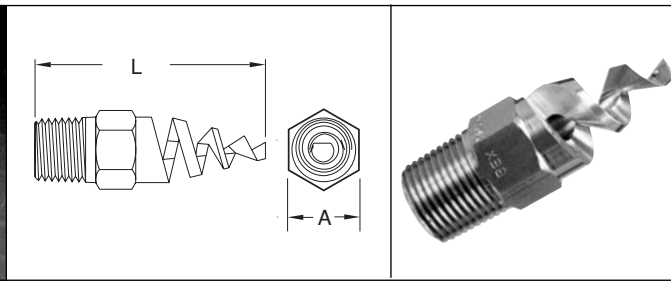
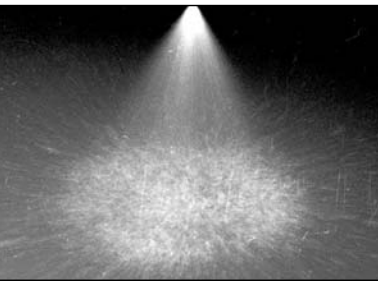
NOZZLE SIZE	Dim. A	Dim. L
1/8GSQ	5/16 HEX	1 5/16
1/4GSQ	11/16 HEX	1 9/16
3/8GSQ	13/16 HEX	1 11/16
1/2GSQ	1 HEX	2
1/8FGSQ	5/16 HEX	1 9/32
1/4FGSQ	11/16 HEX	1 21/32
3/8FGSQ	13/16 HEX	1 15/16
1/2FGSQ	1 HEX	2 2/32



'SQ' one piece body		'GSQ' two piece body		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												Spray Angle @		
FEMALE	MALE	FEMALE	MALE			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi	
	1/8S3.6SQ	1/8FGS3.6SQ	1/8GS3.6SQ	1/8	0.057	--	0.30	0.36	0.44	0.51	0.62	0.72	0.88	1.02	1.14	1.39	42°	55°	50°	
	1/8S4.8SQ	1/8FGS4.8SQ	1/8GS4.8SQ	1/8	0.064	--	0.40	0.48	0.59	0.68	0.83	0.96	1.18	1.36	1.52	1.86	50°	65°	60°	
	1/8S6SQ	1/8FGS6SQ	1/8GS6SQ	1/8	0.081	--	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	30°	65°	60°	
	1/4S6SQ	1/4FGS6SQ	1/4GS6SQ	1/4	0.081	0.42	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	60°	65°	60°	
	1/4S10SQ	1/4FGS10SQ	1/4GS10SQ	1/4	0.091	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	61°	67°	60°	
	1/4S12SQ	1/4FGS12SQ	1/4GS12SQ	1/4	0.091	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	3.4	3.8	4.6	71°	76°	69°	
	1/4S14SQ	1/4FGS14SQ	1/4GS14SQ	1/4	0.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	78°	85°	75°	
	3/8S18SQ	3/8FGS18SQ	3/8GS18SQ	3/8	0.102	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	5.1	5.7	7.0	70°	75°	68°	
	1/2S29SQ	1/2FGS29SQ	1/2GS29SQ	1/2	0.144	2.1	2.4	2.9	3.6	4.1	5.0	5.8	7.1	8.2	9.2	11.2	70°	75°	68°	
	1/2S36SQ	1/2FGS36SQ	1/2GS36SQ	1/2	0.144	2.5	3.0	3.6	4.4	5.1	6.2	7.2	8.8	10.2	11.4	13.9	80°	85°	77°	
	3/4S50SQ			3/4	0.195	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	70°	75°	68°	
	1FS106SQ			1	0.219	7.5	8.9	10.6	13.0	15.0	18.4	21	26	30	34	41.1	77°	80°	72°	
	1 1/4FS177SQ			1 1/4	0.260	12.5	14.8	17.7	21.7	25.0	30.7	35.4	43.4	50	56	69	77°	80°	72°	
	1 1/2FS230SQ			1 1/2	0.392	16.3	19.2	23	28	33	40	46	56	65	73	89	74°	79°	72°	
	2FS290SQ			2	0.438	21	24	29	36	41	50	58	71	82	92	112	65°	70°	65°	
	2FS360SQ			2	0.438	25	30	36	44	51	62	72	88	102	114	139	70°	75°	70°	
	2FS480SQ			2	0.438	34	40	48	59	68	83	96	118	136	152	186	78°	80°	76°	
	2 1/2FS590SQ			2 1/2	0.531	42	49	59	72	83	102	118	145	167	187	229	75°	80°	73°	

All references to G.P.M. mean U.S. G.P.M.

FULL CONE SPRAY



SPRAY CHARACTERISTICS:

A full cone spray pattern with larger flow rates and smaller droplet sizes. Durable, one-piece, anti-clog design has no internal vane to clog or wear out.

CONSTRUCTION:

All models are machined from solid bar stock. Standard materials of construction are brass, 303 stainless steel, 316 stainless steel, PVC and Teflon®. Other materials may be available on request.

TYPICAL APPLICATIONS:

- Washing and Rinsing
- Gas Cooling
- Chemical Processing
- Cooling Sprays
- Humidification

FULL CONE SPRAY

SPRAY ANGLE	MODEL NUMBER	DIMENSIONS		PIPE SIZE (NPT)	ORIFICE DIAMETER (inches)	CAPACITY IN G.P.M. @ VARIOUS PRESSURES (psi)									
		"L"	"A"			5 p.s.i.	7 p.s.i.	10 p.s.i.	20 p.s.i.	30 p.s.i.	40 p.s.i.	60 p.s.i.	100 p.s.i.	200 p.s.i.	300 p.s.i.
60°	1/4YS6007	1.88	9/16	1/4	.087	.49	.59	.70	.99	1.21	1.40	1.71	2.2	3.1	3.8
	1/4YS6013	1.88	9/16	1/4	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8	7.1
	3/8YS6007	2.13	11/16	3/8	.087	.49	.59	.70	.99	1.21	1.40	1.71	2.2	3.1	3.8
	3/8YS6013	2.13	11/16	3/8	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8	7.1
	3/8YS6020	2.13	11/16	3/8	.147	1.41	1.67	2.0	2.8	3.5	4.0	4.9	6.3	8.9	11.0
	3/8YS6030	2.13	11/16	3/8	.180	2.1	2.5	3.0	4.2	5.2	6.0	7.3	9.5	13.4	16.4
	3/8YS6040	2.13	11/16	3/8	.208	2.8	3.3	4.0	5.7	6.9	8.0	9.8	12.6	17.9	21.9
	3/8YS6053	2.13	11/16	3/8	.239	3.7	4.4	5.3	7.5	9.2	10.6	13.0	16.8	24	29
	3/8YS6082	2.13	11/16	3/8	.298	5.8	6.9	8.2	11.6	14.2	16.4	20	26	37	45
	1/2YS60120	2.50	7/8	1/2	.375	8.5	10	12	17	21	24	29	38	54	66
1/2YS60164	2.50	7/8	1/2	.438	11.6	13.7	16.4	23	28	33	40	52	73	90	
90°	1/4YS9007	1.88	9/16	1/4	.087	.49	.59	.70	.99	1.21	1.40	1.71	2.2	3.1	3.8
	1/4YS9013	1.88	9/16	1/4	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8	7.1
	1/4YS9020	1.88	9/16	1/4	.147	1.41	1.67	2.0	2.8	3.5	4.0	4.9	6.3	8.9	11.0
	3/8YS9030	2.13	11/16	3/8	.180	2.1	2.5	3.0	4.2	5.2	6.0	7.3	9.5	13.4	16.4
	3/8YS9040	2.13	11/16	3/8	.208	2.8	3.3	4.0	5.7	6.9	8.0	9.8	12.6	17.9	22
	3/8YS9053	2.13	11/16	3/8	.239	3.7	4.4	5.3	7.5	9.2	10.6	13.0	16.8	24	29
	3/8YS9082	2.13	11/16	3/8	.298	5.8	6.9	8.2	11.6	14.2	16.4	20	26	37	45
	1/2YS90120	2.50	7/8	1/2	.375	8.5	10	12	17	21	24	29	38	54	66
	1/2YS90164	2.50	7/8	1/2	.438	11.6	13.7	16.4	23	28	33	40	52	73	90
	120°	1/4YS12007	1.88	9/16	1/4	.087	.49	.59	.70	.99	1.21	1.40	1.71	2.2	3.1
1/4YS12013		1.88	9/16	1/4	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8	7.1
1/4YS12020		1.88	9/16	1/4	.147	1.41	1.67	2.0	2.8	3.5	4.0	4.9	6.3	8.9	11.0
3/8YS12030		2.13	11/16	3/8	.180	2.1	2.5	3.0	4.2	5.2	6.0	7.3	9.5	13.4	16.4
3/8YS12040		2.13	9/16	3/8	.208	2.8	3.3	4.0	5.7	6.9	8.0	9.8	12.6	17.9	22
3/8YS12053		2.13	11/16	3/8	.239	3.7	4.4	5.3	7.5	9.2	10.6	13.0	16.8	24	29
3/8YS12082		2.13	11/16	3/8	.298	5.8	6.9	8.2	11.6	14.2	16.4	20	26	37	45
1/2YS120120		2.50	7/8	1/2	.375	8.5	10	12	17	21	24	29	38	54	66
1/2YS120164		2.50	7/8	1/2	.438	11.6	13.7	16.4	23	28	33	40	52	73	90
150°		1/4YS15013	1.88	9/16	1/4	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8
	1/4YS15020	1.88	9/16	1/4	.147	1.41	1.67	2.0	2.8	3.5	4.0	4.9	6.3	8.9	11.0
	3/8YS15030	2.13	11/16	3/8	.180	2.1	2.5	3.0	4.2	5.2	6.0	7.3	9.5	13.4	16.4
	3/8YS15040	2.13	11/16	3/8	.208	2.8	3.3	4.0	5.7	6.9	8.0	9.8	12.6	17.9	22
	3/8YS15053	2.13	11/16	3/8	.239	3.7	4.4	5.3	7.5	9.2	10.6	13.0	16.8	24	29
	3/8YS15082	2.13	11/16	3/8	.298	5.8	6.9	8.2	11.6	14.2	16.4	20	26	37	45
	1/2YS150120	2.50	7/8	1/2	.375	8.5	10	12	17	21	24	29	38	54	66
	1/2YS150164	2.50	7/8	1/2	.438	11.6	13.7	16.4	23	28	33	40	52	73	90

All references to G.P.M. mean U.S. G.P.M.

SPRAY ANGLE	MODEL NUMBER	DIMENSIONS		PIPE SIZE (NPT)	ORIFICE DIAMETER (inches)	CAPACITY IN G.P.M. @ VARIOUS PRESSURES (psi)									
		"L"	"A"			5 p.s.i.	7 p.s.i.	10 p.s.i.	20 p.s.i.	30 p.s.i.	40 p.s.i.	60 p.s.i.	100 p.s.i.	200 p.s.i.	300 p.s.i.
170°	1/4YS17013	1.88	9/16	1/4	.119	.92	1.09	1.30	1.84	2.3	2.6	3.2	4.1	5.8	7.1
	1/4YS17020	1.88	9/16	1/4	.147	1.41	1.67	2.0	2.8	3.5	4.0	4.9	6.3	8.9	11.0
	3/8YS17030	2.13	11/16	3/8	.180	2.1	2.5	3.0	4.2	5.2	6.0	7.3	9.5	13.4	16.4
	3/8YS17040	2.13	11/16	3/8	.208	2.8	3.3	4.0	5.7	6.9	8.0	9.8	12.6	17.9	22
	3/8YS17053	2.13	11/16	3/8	.239	3.7	4.4	5.3	7.5	9.2	10.6	13.0	16.8	24	29
	3/8YS17082	2.13	11/16	3/8	.298	5.8	6.9	8.2	11.6	14.2	16.4	20	26	37	45
	1/2YS170120	2.50	7/8	1/2	.321	8.5	10.0	12.0	17	20	24	29	38	53	66
	1/2YS170164	2.50	7/8	1/2	.375	11.6	13.7	16.4	23	28	33	40	52	73	90
	1/2YS170170	2.50	7/8	1/2	.438	12.0	14.2	17	24	29	34	42	54	76	93

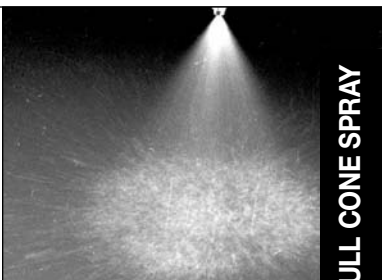
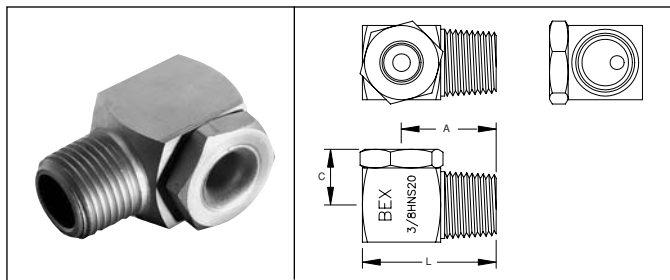
All references to G.P.M. mean U.S. G.P.M.

Vaneless full cone nozzles

HNS SERIES

DIMENSIONS

MODEL NUMBER FEMALE	Dim. A	Dim. C	Dim. L	MODEL NUMBER MALE	Dim. A	Dim. C	Dim. L
1/4FHNS	0.94	0.50	1.2	1/4HNS	0.94	0.50	1.2
3/8FHNS	1.0	0.56	1.4	3/8HNS	1.1	0.63	1.5
1/2FHNS	1.4	0.75	1.9	1/2HNS	1.4	0.75	1.9



SPRAY CHARACTERISTICS:

The HNS series vaneless full-cone nozzle projects a medium to coarse full-cone spray in a direction perpendicular to the nozzle inlet axis. The maximum free passage in this nozzle is substantially larger than most full-cone nozzles due to the 'vaneless' design. This nozzle is suitable for applications where a relatively coarse full-cone spray is required, and where standard nozzles are subject to plugging.

CONSTRUCTION:

The HNS series are made from bar stock and are a two piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Other materials are available upon request.

TYPICAL APPLICATIONS:

Wherever a medium to coarse full-cone spray is required from a nozzle with a larger maximum free passage.

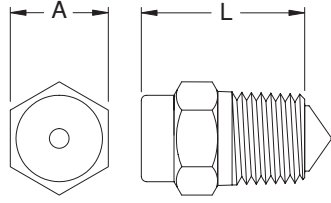
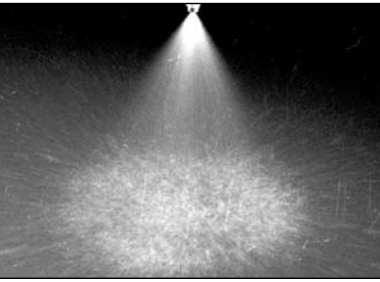
SPECIAL FEATURES:

- 'Vaneless' full-cone design
- Large maximum free passage
- Easy disassembly/assembly and cleaning

MODEL NUMBER		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											
FEMALE	MALE			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	125 psi	
1/4FHNS5	1/4HNS5	1/4	0.078	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77	
1/4FHNS7	1/4HNS7	1/4	0.094	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	1.98	2.2	2.5	
1/4FHNS8	1/4HNS8	1/4	0.109	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5	2.8	
1/4FHNS10	1/4HNS10	1/4	0.125	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.5	
1/4FHNS11	1/4HNS11	1/4	0.141	0.78	0.92	1.1	1.35	1.56	1.91	2.2	2.7	3.1	3.5	3.9	
3/8FHNS11	3/8HNS11	3/8	0.125	0.78	0.92	1.1	1.35	1.56	1.91	2.2	2.7	3.1	3.5	3.9	
3/8FHNS13	3/8HNS13	3/8	0.141	0.92	1.09	1.3	1.59	1.84	2.3	2.6	3.2	3.7	4.1	4.6	
3/8FHNS16	3/8HNS16	3/8	0.156	1.13	1.34	1.6	1.96	2.3	2.8	3.2	3.9	4.5	5.1	5.7	
3/8FHNS20	3/8HNS20	3/8	0.172	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.1	
3/8FHNS23	3/8HNS23	3/8	0.188	1.63	1.92	2.3	2.8	3.3	4.0	4.6	5.6	6.5	7.3	8.1	
3/8FHNS26	3/8HNS26	3/8	0.203	1.84	2.2	2.6	3.2	3.7	4.5	5.2	6.4	7.4	8.2	9.2	
3/8FHNS29	3/8HNS29	3/8	0.219	2.1	2.4	2.9	3.6	4.1	5.0	5.8	7.1	8.2	9.2	10.3	
3/8FHNS33	3/8HNS33	3/8	0.234	2.3	2.8	3.3	4.0	4.7	5.7	6.6	8.1	9.3	10.4	11.7	
1/2FHNS32	1/2HNS32	1/2	0.203	2.3	2.7	3.2	3.9	4.5	5.5	6.4	7.8	9.1	10.1	11.3	
1/2FHNS40	1/2HNS40	1/2	0.234	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6	14.1	
1/2FHNS48	1/2HNS48	1/2	0.281	3.4	4.0	4.8	5.9	6.8	8.3	9.6	11.8	13.6	15.2	17.0	
1/2FHNS56	1/2HNS56	1/2	0.297	4.0	4.7	5.6	6.9	7.9	9.7	11.2	13.7	15.8	17.7	19.8	
1/2FHNS64	1/2HNS64	1/2	0.328	4.5	5.4	6.4	7.8	9.1	11.1	12.8	15.7	18.1	20	23	
1/2FHNS72	1/2HNS72	1/2	0.359	5.1	6.0	7.2	8.8	10.2	12.5	14.4	17.6	20	23	25	

CCS SERIES

Full cone spray nozzles



DIMENSIONS

MODEL NUMBER	Dim. A	Dim. L
1/4CCS	9/16 HEX	15/16
3/8CCS	11/16 HEX	13/16

SPRAY CHARACTERISTICS:

Full cone spray pattern with a distribution that is heavier in the middle. Spray angle remains nearly constant at pressures between 20 and 80 p.s.i.

CONSTRUCTION:

CCS nozzles are machined from bar, and consist of a one piece body, plus a non-removable insert. Standard material is brass.

TYPICAL APPLICATIONS:

Suitable for temperature control applications, where the volume of sprayed coolant can be adjusted without significantly affecting spray coverage. This enables the user to maximize heat transfer efficiency while avoiding loss of coverage area. CCS nozzles feature an internal insert which will not come loose in environments which are subject to thermal cycling.

- Continuous Casting and Billet Casting
- Rinsing and Cooling
- Heat Exchanger Cooling
- Chemical Processing

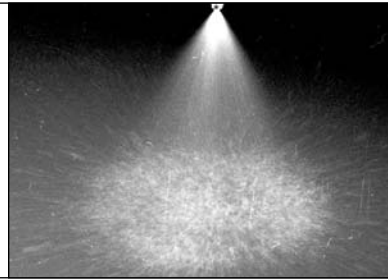
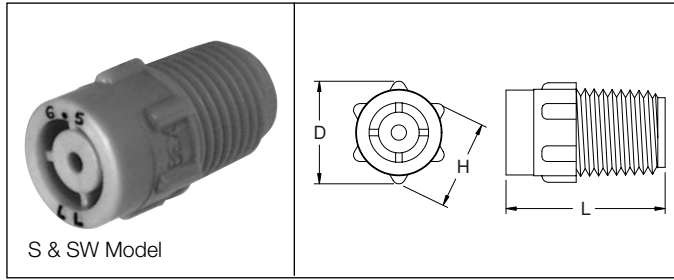
FULL CONE SPRAY

SPRAY ANGLE @ 40psi	MODEL NUMBER	PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										
				15 psi	20 psi	25 psi	30 psi	40 psi	50 psi	60 psi	70 psi	80 psi	90 psi	100 psi
49°	1/4CCS4917	1/4	0.091	1.04	1.20	1.34	1.47	1.70	1.90	2.1	2.2	2.4	2.6	2.7
	3/8CCS4917	3/8	0.091	1.04	1.20	1.34	1.47	1.70	1.90	2.1	2.2	2.4	2.6	2.7
	3/8CCS4922	3/8	0.091	1.35	1.56	1.74	1.91	2.2	2.5	2.7	2.9	3.1	3.3	3.5
	3/8CCS4927	3/8	0.102	1.65	1.91	2.1	2.3	2.7	3.0	3.3	3.6	3.8	4.1	4.3
	3/8CCS4931	3/8	0.114	1.90	2.2	2.5	2.7	3.1	3.5	3.8	4.1	4.4	4.7	4.9
57°	1/4CCS5710	1/4	0.064	0.61	0.71	0.79	0.87	1.00	1.12	1.22	1.32	1.41	1.50	1.58
	1/4CCS5713	1/4	0.081	0.80	0.92	1.03	1.13	1.30	1.45	1.59	1.72	1.84	2.0	2.1
	1/4CCS5715	1/4	0.091	0.92	1.06	1.19	1.30	1.50	1.68	1.84	2.0	2.1	2.3	2.4
	1/4CCS5718	1/4	0.091	1.10	1.27	1.42	1.56	1.80	2.0	2.2	2.4	2.5	2.7	2.8
	3/8CCS5718	3/8	0.091	1.10	1.27	1.42	1.56	1.80	2.0	2.2	2.4	2.5	2.7	2.8
	3/8CCS5726	3/8	0.091	1.59	1.84	2.1	2.3	2.6	2.9	3.2	3.4	3.7	3.9	4.1
	3/8CCS5731	3/8	0.102	1.9	2.2	2.5	2.7	3.1	3.5	3.8	4.1	4.4	4.7	4.9
	3/8CCS5744	3/8	0.114	2.7	3.1	3.5	3.8	4.4	4.9	5.4	5.8	6.2	6.6	7.0
66°	1/4CCS6614	1/4	0.064	0.86	0.99	1.11	1.21	1.40	1.57	1.71	1.85	2.0	2.1	2.2
	1/4CCS6624	1/4	0.091	1.47	1.70	1.90	2.1	2.4	2.7	2.9	3.2	3.4	3.6	3.8
	1/4CCS6629	1/4	0.091	1.78	2.1	2.3	2.5	2.9	3.2	3.6	3.8	4.1	4.4	4.6
	3/8CCS6629	3/8	0.091	1.78	2.1	2.3	2.5	2.9	3.2	3.6	3.8	4.1	4.4	4.6
	3/8CCS6633	3/8	0.091	2.0	2.3	2.6	2.9	3.3	3.7	4.0	4.4	4.7	5.0	5.2
	3/8CCS6648	3/8	0.114	2.9	3.4	3.8	4.2	4.8	5.4	5.9	6.3	6.8	7.2	7.6
76°	1/4CCS7622	1/4	0.091	1.35	1.56	1.74	1.91	2.2	2.5	2.7	2.9	3.1	3.3	3.5
	1/4CCS7628	1/4	0.091	1.71	2.0	2.2	2.4	2.8	3.1	3.4	3.7	4.0	4.2	4.4
	3/8CCS7628	3/8	0.091	1.71	2.0	2.2	2.4	2.8	3.1	3.4	3.7	4.0	4.2	4.4
	3/8CCS7638	3/8	0.091	2.3	2.7	3.0	3.3	3.8	4.2	4.7	5.0	5.4	5.7	6.0
	3/8CCS7664	3/8	0.114	3.9	4.5	5.1	5.5	6.4	7.2	7.8	8.5	9.1	9.6	10.1
86°	1/4CCS8618	1/4	0.091	1.10	1.27	1.42	1.56	1.80	2.0	2.2	2.4	2.5	2.7	2.8
	1/4CCS8633	1/4	0.091	2.0	2.3	2.6	2.9	3.3	3.7	4.0	4.4	4.7	5.0	5.2
	3/8CCS8633	3/8	0.091	2.0	2.3	2.6	2.9	3.3	3.7	4.0	4.4	4.7	5.0	5.2
	3/8CCS8642	3/8	0.091	2.6	3.0	3.3	3.6	4.2	4.7	5.1	5.6	5.9	6.3	6.6
	3/8CCS8649	3/8	0.102	3.0	3.5	3.9	4.2	4.9	5.5	6.0	6.5	6.9	7.4	7.7
	3/8CCS8667	3/8	0.114	4.1	4.7	5.3	5.8	6.7	7.5	8.2	8.9	9.5	10.1	10.6

All references to G.P.M. mean U.S. G.P.M.

DIMENSIONS

NOZZLE TYPE	Dim. D	Dim. H	Dim. L
1/8S	0.62	9/16	0.81
1/4S	0.62	9/16	0.96
3/8S	0.77	11/16	1.10
1/8SW	0.62	9/16	0.63
1/8SQ	0.62	9/16	0.81
1/4SQ	0.77	11/16	0.96



SPRAY CHARACTERISTICS:

These models produce a full cone spray pattern with spray angles of 60° to 120° @ 10 psi.

PVDF - excellent durability and abrasion resistance and is inert to most chemicals. Many applications useful up to 300°F.

CONSTRUCTION:

Each BEX molded nozzle is designed with a series of "knobs" which makes them easier to finger tighten than a hex, especially when wet. The design feature of a small starter barrel greatly reduces the tendency to strip or cross-thread the nozzle during installation.

Natural PVDF - where solution purity must be optimized.



FITTING SIZES:

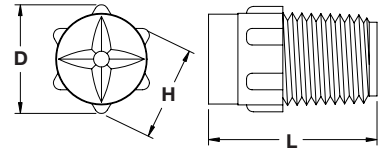
1/8", 1/4" and 3/8" MALE NPT (BSPT also available)

STANDARD MODELS LISTED IN TABLES BELOW.

ADDITIONAL MODELS MAY BE AVAILABLE UPON REQUEST.

MATERIALS AVAILABLE:

Polypropylene - excellent chemical and corrosion resistance. Useful up to 175°F.



Natural Polypropylene - non-pigmented for optimum purity.

TYPICAL APPLICATIONS:

- Printed Circuit Board Washing
- PCB-Etching/Developing
- Semiconductor Manufacturing
- Carpet Cleaning
- Fruit and Vegetable Washing
- Plating Processes
- Dust Suppression
- Acid Spraying
- Degreasing
- Coating Applications
- Metal Washing
- Chemical Spraying
- Rinsing Parts

MOLDED PLASTIC S SERIES FULL CONE SPRAY MODELS
(For capacity and spray angle data please refer to table on page 21)

1/8 Models	1/8S1	1/8S1.5	1/8S3	1/8S5	1/8S6
1/4 Models	1/4S6.5	1/4S7.5	1/4S10		
3/8 Models	3/8S10	3/8S15	SN4780 (70° spray angle/1.5 G.P.M. @ 40 psi)		

MOLDED PLASTIC SW WIDE ANGLE FULL CONE SPRAY MODELS
(For capacity and spray angle data please refer to table on page 23)

1/8 Models	1/8S2.8W	1/8S4.3W	1/8S5.6W	1/8S8W
1/4 Models	1/4S5.6W	1/4S10W	1/4S12W	1/4S14W

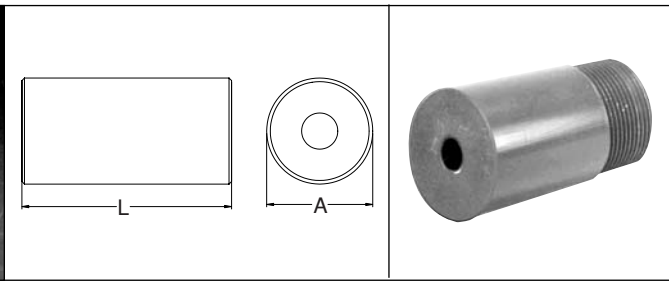
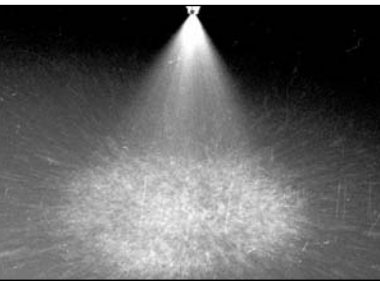
MOLDED PLASTIC SQ SERIES FULL CONE SPRAY MODELS
(For capacity and spray angle data please refer to table on page 24)

1/8 Models	1/8S4.8SQ	1/8S5SQ		
1/4 Models	1/4S6SQ	1/4S10SQ	1/4S12SQ	1/4S14SQ

All references to G.P.M. mean U.S. G.P.M.

FULL CONE SPRAY

PS & PSW SERIES Plastic full cone spray nozzles



SPRAY CHARACTERISTICS:

A full cone spray pattern with large flow capacities. Spray angle is 90° (included angle). Other sizes and spray angles available upon request.

CONSTRUCTION:

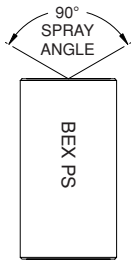
The models listed are machined from plastic and consist of a body plus a non-removable insert. Standard materials are PVC, CPVC and polypropylene.

DIMENSIONS

FEMALE FPS	Dim. L	Dim. A	MALE PS	Dim. L	Dim. A
1 ¹ / ₄ FPS	3 ³ / ₄	2	1 ¹ / ₄ PS	3	1 ³ / ₄
1 ¹ / ₂ FPS	4 ¹ / ₄	2 ¹ / ₂	1 ¹ / ₂ PS	4	2
2FPS	5 ⁷ / ₈	3	2PS	5 ⁵ / ₈	2 ¹ / ₂
2 ¹ / ₂ FPS	5 ⁷ / ₈	3 ¹ / ₂	2 ¹ / ₂ PS	5 ⁵ / ₈	4
3FPS	5 ⁷ / ₈	4	3PS	5 ¹ / ₂	3 ¹ / ₂

TYPICAL APPLICATIONS:

- Scrubbing and Pollution Control
- Rinsing and Cooling



FULL CONE SPRAY

MODEL NUMBER		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)									
FEMALE	MALE			3 psi	5 psi	7 psi	10 psi	20 psi	40 psi	60 psi	80 psi	100 psi	
1 ¹ / ₄ FPS17	1 ¹ / ₄ PS17	1 ¹ / ₄	1 ¹ / ₄	9.3	12.0	14.2	17.0	24	34	42	48	54	
1 ¹ / ₄ FPS20	1 ¹ / ₄ PS20	1 ¹ / ₄	1 ¹ / ₄	11.0	14.1	16.7	20	28	40	49	57	63	
1 ¹ / ₂ FPS17	1 ¹ / ₂ PS17	1 ¹ / ₂	1 ¹ / ₄	9.3	12.0	14.2	17.0	24	34	42	48	54	
1 ¹ / ₂ FPS19	1 ¹ / ₂ PS19	1 ¹ / ₂	1 ¹ / ₄	10.4	13.4	15.9	19.0	27	38	47	54	60	
1 ¹ / ₂ FPS21	1 ¹ / ₂ PS21	1 ¹ / ₂	1 ¹ / ₄	11.5	14.8	17.6	21	30	42	51	59	66	
1 ¹ / ₂ FPS25	1 ¹ / ₂ PS25	1 ¹ / ₂	5 ⁵ / ₁₆	13.7	17.7	21	25	35	50	61	71	79	
1 ¹ / ₂ FPS29	1 ¹ / ₂ PS29	1 ¹ / ₂	5 ⁵ / ₁₆	15.9	21	24	29	41	58	71	82	92	
2FPS20	2PS20	2	1 ¹ / ₄	11.0	14.1	16.7	20	28	40	49	57	63	
2FPS25	2PS25	2	5 ⁵ / ₁₆	13.7	17.7	21	25	35	50	61	71	79	
2FPS32	2PS32	2	5 ⁵ / ₁₆	17.5	23	27	32	45	64	78	91	101	
2FPS40	2PS40	2	3 ³ / ₈	22	28	33	40	57	80	98	113	126	
2FPS48	2PS48	2	3 ³ / ₈	26	34	40	48	68	96	118	136	152	
2FPS55	2PS55	2	17 ¹⁷ / ₃₂	30	39	46	55	78	110	135	156	174	
2FPS60	2PS60	2	17 ¹⁷ / ₃₂	33	42	50	60	85	120	147	170	190	
2FPS72	2PS72	2	9 ⁹ / ₁₆	39	51	60	72	102	144	176	204	228	
2FPS76	2PS76	2	9 ⁹ / ₁₆	42	54	64	76	107	152	186	215	240	
2FPS84	2PS84	2	5 ⁵ / ₈	46	59	70	84	119	168	206	238	266	
2 ¹ / ₂ FPS84	2 ¹ / ₂ PS84	2 ¹ / ₂	5 ⁵ / ₈	46	59	70	84	119	168	206	238	266	
2 ¹ / ₂ FPS96	2 ¹ / ₂ PS96	2 ¹ / ₂	11 ¹¹ / ₁₆	53	68	80	96	136	192	235	272	304	
2 ¹ / ₂ FPS108	2 ¹ / ₂ PS108	2 ¹ / ₂	11 ¹¹ / ₁₆	59	76	90	108	153	216	265	305	342	
3FPS70	3PS70	3	9 ⁹ / ₁₆	38	49	59	70	99	140	171	198	221	
3FPS100	3PS100	3	11 ¹¹ / ₁₆	55	71	84	100	141	200	245	283	316	
3FPS115	3PS115	3	11 ¹¹ / ₁₆	63	81	96	115	163	230	282	325	364	
3FPS140	3PS140	3	13 ¹³ / ₁₆	77	99	117	140	198	280	343	396	443	

All references to G.P.M. mean U.S. G.P.M.

Plastic wide angle full cone spray nozzles

SPRAY CHARACTERISTICS:

A full cone spray pattern with large flow capacities. Similar to the PS series above, but with a wider spray angle of 120° (included angle). Other sizes and spray angles available upon request.

CONSTRUCTION:

The models listed are machined from plastic and consist of a body plus a non-removable

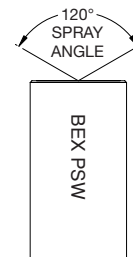
insert. Standard materials are PVC, CPVC and polypropylene.

DIMENSIONS:

Same as PS series (above).

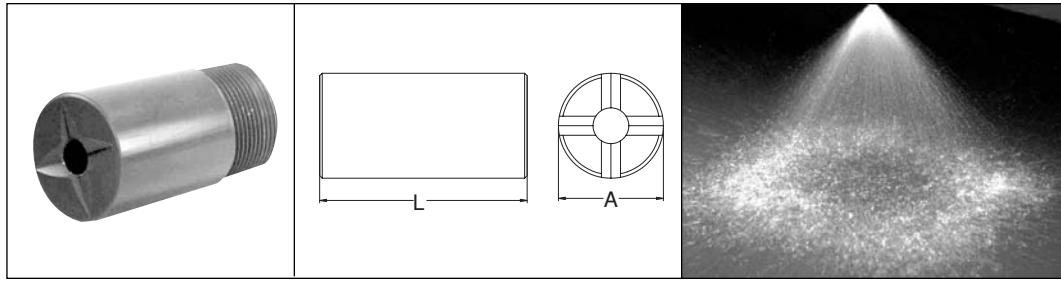
TYPICAL APPLICATIONS:

Same as PS series, but where a wider spray coverage is required.



SAME CAPACITIES AS PS SERIES (above). ADD "W" AT THE END OF THE MODEL NUMBER FOR WIDE ANGLE WHEN ORDERING (IE: 2FPS40W).

Plastic full square spray nozzles **PSQ & PSWSQ SERIES**



DIMENSIONS

FEMALE FPSQ	Dim. L	Dim. A	MALE PSQ	Dim. L	Dim. A
1 ¹ / ₄ FPS	3 ¹ / ₄	2	1 ¹ / ₄ PS	3	1 ³ / ₄
1 ¹ / ₂ FPS	4 ¹ / ₄	2 ¹ / ₂	1 ¹ / ₂ PS	4	2
2FPS	5 ⁷ / ₈	3	2PS	5 ⁵ / ₈	2 ¹ / ₂
2 ¹ / ₂ FPS	5 ⁷ / ₈	3 ¹ / ₂	2 ¹ / ₂ PS	5 ⁵ / ₈	4
3FPS	5 ⁷ / ₈	4	3PS	5 ¹ / ₂	3 ¹ / ₂

TYPICAL APPLICATIONS:

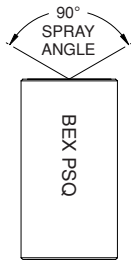
- Scrubbing and Pollution Control
- Rinsing and Cooling

SPRAY CHARACTERISTICS:

A full square spray pattern with large flow capacities. Spray angle is 90° (included angle). Other sizes and angles available upon request.

CONSTRUCTION:

The models listed are machined from plastic and consist of a body plus a non-removable insert. Standard materials are PVC, CPVC and polypropylene.



MODEL NUMBER		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										
FEMALE	MALE			3 psi	5 psi	7 psi	10 psi	20 psi	40 psi	60 psi	80 psi	100 psi		
1 ¹ / ₄ FPS17SQ	1 ¹ / ₄ PS17SQ	1 ¹ / ₄	1 ¹ / ₄	9.3	12.0	14.2	17.0	24	34	42	48	54		
1 ¹ / ₄ FPS20SQ	1 ¹ / ₄ PS20SQ	1 ¹ / ₄	1 ¹ / ₄	11.0	14.1	16.7	20	28	40	49	57	63		
1 ¹ / ₂ FPS17SQ	1 ¹ / ₂ PS17SQ	1 ¹ / ₂	1 ¹ / ₄	9.3	12.0	14.2	17.0	24	34	42	48	54		
1 ¹ / ₂ FPS19SQ	1 ¹ / ₂ PS19SQ	1 ¹ / ₂	1 ¹ / ₄	10.4	13.4	15.9	19.0	27	38	47	54	60		
1 ¹ / ₂ FPS21SQ	1 ¹ / ₂ PS21SQ	1 ¹ / ₂	1 ¹ / ₄	11.5	14.8	17.6	21	30	42	51	59	66		
1 ¹ / ₂ FPS25SQ	1 ¹ / ₂ PS25SQ	1 ¹ / ₂	5 ¹ / ₁₆	13.7	17.7	21	25	35	50	61	71	79		
1 ¹ / ₂ FPS29SQ	1 ¹ / ₂ PS29SQ	1 ¹ / ₂	5 ¹ / ₁₆	15.9	21	24	29	41	58	71	82	92		
2FPS20SQ	2PS20SQ	2	1 ¹ / ₄	11.0	14.1	16.7	20	28	40	49	57	63		
2FPS25SQ	2PS25SQ	2	5 ¹ / ₁₆	13.7	17.7	21	25	35	50	61	71	79		
2FPS32SQ	2PS32SQ	2	5 ¹ / ₁₆	17.5	23	27	32	45	64	78	91	101		
2FPS40SQF	2PS40SQ	2	3 ³ / ₈	22	28	33	40	57	80	98	113	126		
2PS48SQ	2PS48SQ	2	3 ³ / ₈	26	34	40	48	68	96	118	136	152		
2FPS55SQ	2PS55SQ	2	1 ⁷ / ₃₂	30	39	46	55	78	110	135	156	174		
2FPS60SQ	2PS60SQ	2	1 ⁷ / ₃₂	33	42	50	60	85	120	147	170	190		
2FPS72SQ	2PS72SQ	2	9 ¹ / ₁₆	39	51	60	72	102	144	176	204	228		
2FPS76SQ	2PS76SQ	2	9 ¹ / ₁₆	42	54	64	76	107	152	186	215	240		
2FPS84SQ	2PS84SQ	2	5 ¹ / ₈	46	59	70	84	119	168	206	238	266		
2 ¹ / ₂ FPS84SQ	2 ¹ / ₂ PS84SQ	2 ¹ / ₂	5 ¹ / ₈	46	59	70	84	119	168	206	238	266		
2 ¹ / ₂ FPS96SQ	2 ¹ / ₂ PS96SQ	2 ¹ / ₂	1 ¹ / ₁₆	53	68	80	96	136	192	235	272	304		
2 ¹ / ₂ FPS108SQ	2 ¹ / ₂ PS108SQ	2 ¹ / ₂	1 ¹ / ₁₆	59	76	90	108	153	216	265	305	342		
3FPS70SQ	3PS70SQ	3	9 ¹ / ₁₆	38	49	59	70	99	140	171	198	221		
3FPS100SQ	3PS100SQ	3	1 ¹ / ₁₆	55	71	84	100	141	200	245	283	316		
3FPS115SQ	3PS115SQ	3	1 ¹ / ₁₆	63	81	96	115	163	230	282	325	364		
3FPS140SQ	3PS140SQ	3	1 ³ / ₁₆	77	99	117	140	198	280	343	396	443		

All references to G.P.M. mean U.S. G.P.M.

Plastic wide angle full square spray nozzles

SPRAY CHARACTERISTICS:

A full square spray pattern with large flow capacities. Similar to the PSQ series above, except with a wider spray angle of 120° (included angle). Other sizes and spray angles available upon request.

CONSTRUCTION:

The models listed are machined from plastic and consist of a body plus a non-removable

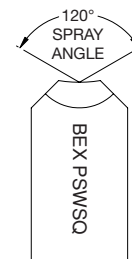
insert. Standard materials are PVC, CPVC and polypropylene.

DIMENSIONS:

Same as PSQ series (above).

TYPICAL APPLICATIONS:

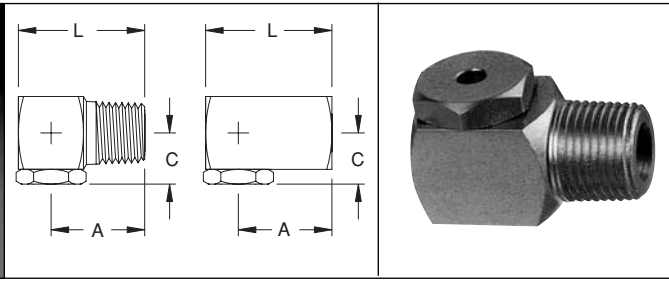
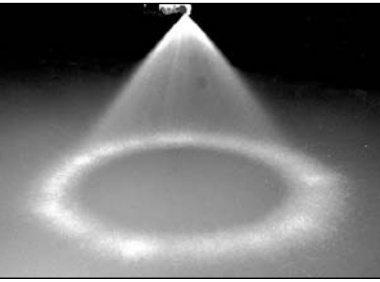
Same as PSQ series, but where a wider spray coverage is required.



SAME CAPACITIES AS PSQ SERIES (above). ADD "WSQ" AT THE END OF THE MODEL NUMBER FOR WIDE ANGLE WHEN ORDERING (IE: 2FPS40WSQ).

H SERIES

Hollow cone spray nozzles



DIMENSIONS

MALE MODEL	Dim. A	Dim. C	Dim. L	FEMALE MODEL	Dim. A	Dim. C	Dim. L
1/8H	11/16	3/8	1	1/8FH	11/16	3/8	1
1/4H	15/16	1/2	1 1/4	1/4FH	15/16	1/2	1 1/4
3/8H	1	9/16	1 3/8	3/8FH	1	5/8	1 1/2
1/2H	1 3/8	3/4	1 7/8	1/2FH	1 3/8	3/4	1 7/8
3/4H	1 9/16	7/8	2 1/4	3/4FH	1 9/16	7/8	2 1/4

SPRAY CHARACTERISTICS:

A hollow cone spray pattern, emerging at right angles to the centerline of the pipe connection. The standard included angle of the spray cone is 70° at 10 p.s.i. At low pressures hollow cone nozzles produce medium size, uniform droplets. At higher pressures finer droplets are produced.

CONSTRUCTION:

The models listed are machined from bar stock, and are two piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models available in other materials.

TYPICAL APPLICATIONS:

- Air and Gas Washing
- Aerating, Rinsing and Humidifying
- Industrial Washers and Spray Ponds
- Cooling Tunnels
- Roof Cooling
- Degreasing
- Dust Suppression
- Metal Treatment

MODEL NUMBER		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											SPRAY ANGLE @			
FEMALE	MALE			3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	10 psi	20 psi	40 psi	80 psi
1/8FH0.5	1/8H0.5	1/8	0.028	--	--	--	--	--	--	0.09	0.10	0.12	0.14	0.16	--	--	40°	45°
1/8FH1	1/8H1	1/8	0.053	--	--	--	--	0.12	0.14	0.17	0.20	0.24	0.28	0.32	--	60°	74°	75°
1/8FH2	1/8H2	1/8	0.086	--	--	--	--	0.24	0.28	0.35	0.40	0.49	0.57	0.63	--	65°	72°	76°
1/8FH3	1/8H3	1/8	0.098	--	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	65°	76°	80°	83°
1/8FH5	1/8H5	1/8	0.128	--	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	70°	77°	80°	81°
1/8FH7.5	1/8H7.5	1/8	0.153	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	70°	86°	94°	94°
1/8FH10	1/8H10	1/8	0.171	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	70°	71°	73°	75°
1/4FH1	1/4H1	1/4	0.060	--	--	0.08	0.10	0.12	0.14	0.17	0.20	0.24	0.28	0.32	--	61°	74°	69°
1/4FH2	1/4H2	1/4	0.085	--	--	--	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	70°	75°	83°	85°
1/4FH3	1/4H3	1/4	0.111	--	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	70°	70°	72°	74°
1/4FH5	1/4H5	1/4	0.136	--	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	70°	77°	80°	83°
1/4FH7.5	1/4H7.5	1/4	0.166	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	70°	70°	74°	75°
1/4FH10	1/4H10	1/4	0.170	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	70°	74°	76°	80°
1/4FH12.5	1/4H12.5	1/4	0.177	0.68	0.88	1.05	1.25	1.53	1.77	2.17	2.5	3.1	3.5	4.0	70°	82°	83°	83°
1/4FH15	1/4H15	1/4	0.213	0.82	1.06	1.25	1.50	1.84	2.1	2.60	3.0	3.7	4.2	4.7	70°	73°	75°	75°
3/8FH5	3/8H5	3/8	0.136	--	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	70°	74°	76°	76°
3/8FH7.5	3/8H7.5	3/8	0.164	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	70°	74°	78°	82°
3/8FH10	3/8H10	3/8	0.194	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	70°	78°	80°	81°
3/8FH12.5	3/8H12.5	3/8	0.205	0.68	0.88	1.05	1.25	1.53	1.77	2.17	2.5	3.1	3.5	4.0	70°	80°	82°	84°
3/8FH15	3/8H15	3/8	0.232	0.82	1.06	1.25	1.50	1.84	2.1	2.60	3.0	3.7	4.2	4.7	70°	73°	75°	75°
3/8FH20	3/8H20	3/8	0.250	1.10	1.41	1.67	2.0	2.45	2.8	3.46	4.0	4.9	5.7	6.3	70°	73°	75°	75°
3/8FH25	3/8H25	3/8	0.279	1.37	1.77	2.1	2.5	3.06	3.5	4.33	5.0	6.1	7.1	7.9	70°	72°	73°	73°
3/8FH30	3/8H30	3/8	0.292	1.64	2.1	2.5	3.0	3.67	4.2	5.20	6.0	7.3	8.5	9.5	70°	70°	73°	72°
1/2FH25	1/2H25	1/2	0.295	1.37	1.77	2.1	2.5	3.06	3.5	4.33	5.0	6.1	7.1	7.9	70°	75°	76°	76°
1/2FH30	1/2H30	1/2	0.329	1.64	2.1	2.5	3.0	3.67	4.2	5.20	6.0	7.3	8.5	9.5	70°	78°	80°	81°
1/2FH40	1/2H40	1/2	0.369	2.2	2.8	3.3	4.0	4.90	5.7	6.93	8.0	9.8	11.3	12.6	70°	75°	75°	75°
1/2FH50	1/2H50	1/2	0.393	2.7	3.5	4.2	5.0	6.12	7.1	8.66	10.0	12.2	14.1	15.8	70°	70°	71°	73°
1/2FH60	1/2H60	1/2	0.421	3.3	4.2	5.0	6.0	7.35	8.5	10.39	12.0	14.7	17.0	19.0	70°	70°	71°	71°
3/4FH40	3/4H40	3/4	0.368	2.2	2.8	3.3	4.0	4.90	5.7	6.93	8.0	9.8	11.3	12.6	70°	71°	76°	79°
3/4FH50	3/4H50	3/4	0.421	2.7	3.5	4.2	5.0	6.12	7.1	8.66	10.0	12.2	14.1	15.8	70°	73°	74°	74°
3/4FH60	3/4H60	3/4	0.438	3.3	4.2	5.0	6.0	7.35	8.5	10.39	12.0	14.7	17.0	19.0	70°	75°	78°	80°
3/4FH70	3/4H70	3/4	0.469	3.8	4.9	5.9	7.0	8.57	9.9	12.12	14.0	17.1	19.8	22.1	70°	74°	76°	76°
3/4FH80	3/4H80	3/4	0.484	4.4	5.7	6.7	8.0	9.80	11.3	13.86	16.0	19.6	23	25	70°	73°	75°	76°
3/4FH90	3/4H90	3/4	0.500	4.9	6.4	7.5	9.0	11.02	12.7	15.59	18.0	22	25	28	70°	70°	71°	73°
3/4FH100	3/4H100	3/4	0.507	5.5	7.1	8.4	10.0	12.25	14.1	17.32	20	24	28	32	70°	73°	76°	78°
3/4FH110	3/4H110	3/4	0.575	6.0	7.8	9.2	11.0	13.47	15.6	19.05	22	27	31	35	70°	72°	75°	72°
3/4FH120	3/4H120	3/4	0.568	6.6	8.5	10.0	12.0	14.70	17.0	20.78	24	29	34	38	70°	70°	71°	71°

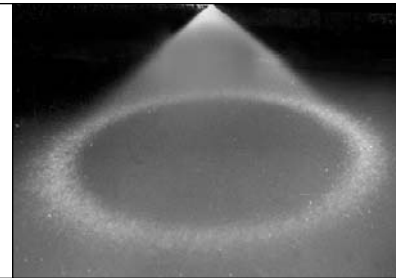
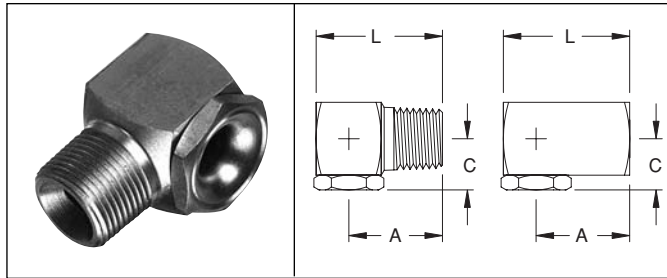
-- means not recommended at this pressure

All references to G.P.M. mean U.S. G.P.M.

HOLLOW CONE SPRAY

Wide angle hollow cone spray nozzles

HW SERIES



DIMENSIONS

MALE MODEL	Dim. A	Dim. L	Dim. C	FEMALE MODEL	Dim. A	Dim. L	Dim. C
1/8HW	11/16	3/8	1	1/8FHW	11/16	3/8	1
1/4HW	15/16	1/2	1 1/4	1/4FHW	15/16	1/2	1 1/4
3/8HW	1	9/16	1 3/8	3/8FHW	1	9/16	1 3/8
1/2HW	1 3/8	3/4	1 7/8	1/2FHW	1 3/8	3/4	1 7/8
3/4HW	1 9/16	7/8	2 1/4	3/4FHW	1 5/8	7/8	2 1/4

TYPICAL APPLICATIONS:

- Water Cooling
- Roof Cooling
- Air Cooling
- Air Washing

SPRAY CHARACTERISTICS:

A hollow cone spray pattern, similar to the BEX H series, but with wider spray angles. The included angle of the spray cone is 120° at 10 p.s.i.

CONSTRUCTION:

The models listed are machined from bar stock, and are two piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models are also available in other materials.

MODEL NUMBER		PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY ANGLE @			
FEMALE	MALE			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	125 psi	10 psi	20 psi	40 psi	80 psi	
1/8FH1W	1/8H1W	1/8	.055	--	--	--	0.12	0.14	0.17	0.20	0.24	0.28	0.32	0.35	--	115°	107°	95°	
1/8FH2W	1/8H2W	1/8	.077	--	0.17	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.71	120°	117°	105°	97°	
1/8FH3W	1/8H3W	1/8	.093	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	1.06	120°	116°	109°	92°	
1/8FH5W	1/8H5W	1/8	.109	--	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77	120°	116°	107°	90°	
1/4FH1W	1/4H1W	1/4	.055	--	0.08	0.10	0.12	0.14	0.17	0.20	0.24	0.28	0.32	0.35	120°	110°	102°	90°	
1/4FH2W	1/4H2W	1/4	.077	--	0.17	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.71	120°	110°	105°	92°	
1/4FH3W	1/4H3W	1/4	.093	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	1.06	120°	114°	104°	90°	
1/4FH5W	1/4H5W	1/4	.109	--	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77	120°	113°	107°	98°	
1/4FH7.5W	1/4H7.5W	1/4	.158	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.8	2.1	2.4	2.7	120°	115°	110°	92°	
1/4FH10W	1/4H10W	1/4	.170	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.5	120°	115°	110°	93°	
1/4FH12.5W	1/4H12.5W	1/4	.188	0.88	1.05	1.25	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.4	120°	118°	110°	94°	
1/4FH15W	1/4H15W	1/4	.201	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.3	120°	115°	108°	92°	
3/8FH5W	3/8H5W	3/8	.109	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77	120°	117°	107°	99°	
3/8FH7.5W	3/8H7.5W	3/8	.158	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	2.7	120°	113°	110°	93°	
3/8FH10W	3/8H10W	3/8	.170	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.5	120°	115°	110°	93°	
3/8FH12.5W	3/8H12.5W	3/8	.188	0.88	1.05	1.25	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.4	120°	115°	108°	94°	
3/8FH15W	3/8H15W	3/8	.201	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.3	120°	110°	105°	90°	
3/8FH20W	3/8H20W	3/8	.234	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.1	120°	118°	116°	110°	
3/8FH25W	3/8H25W	3/8	.265	1.77	2.1	2.5	3.1	3.5	4.3	5.0	6.1	7.1	7.9	8.8	120°	117°	115°	110°	
3/8FH30W	3/8H30W	3/8	.280	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	8.5	9.5	10.6	120°	115°	110°	102°	
1/2FH50W	1/2H50W	1/2	.358	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	17.7	120°	115°	108°	103°	
3/4FH80W	3/4H80W	3/4	.468	5.7	6.7	8.0	9.8	11.3	13.9	16.0	20	23	25	28	120°	117°	110°	103°	

All references to G.P.M. mean U.S. G.P.M.



Hollow cone phosphating nozzles

PH SERIES

SPRAY CHARACTERISTICS:

A hollow cone spray pattern for phosphating applications. This large droplet, low impingement type of spray results in a tighter and more consistent phosphate crystalline structure.

CONSTRUCTION:

Two piece construction. Available in 303 stainless steel and 316 stainless steel.

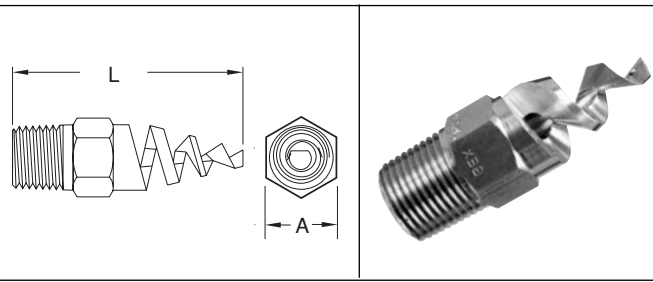
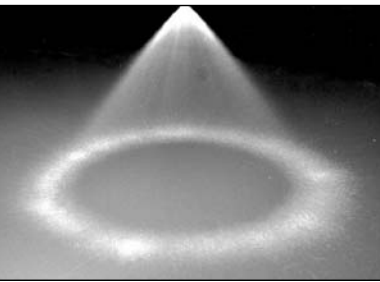


MODEL NUMBER	PIPE SIZE NPT	ORIFICE DIAMETER (inches)		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY ANGLE @		
		BODY	CAP	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	10 psi	15 psi	30 psi		
3/8PH23	3/8	0.220	0.312	1.63	1.92	2.3	2.8	3.3	4.0	4.6	5.6	6.5	7.3	45°	53°	60°		
3/8PH28	3/8	0.231	0.312	2.0	2.3	2.8	3.4	4.0	4.8	5.6	6.9	7.9	8.9	40°	43°	48°		
3/8PH51	3/8	0.344	0.375	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	40°	50°	50°		
3/8PH53	3/8	0.375	0.375	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	70°	70°	70°		

All references to G.P.M. mean U.S. G.P.M.

YH SERIES

Twister® nozzles



SPRAY CHARACTERISTICS:

A hollow cone spray pattern with large flow rates and small droplet sizes.

CONSTRUCTION:

YH Series nozzles have an anti-clog design

that can be easily inspected, cleaned and serviced. Standard materials are brass, 303 stainless steel, 316 stainless steel, PVC and Teflon®. Other materials available upon request.

TYPICAL APPLICATIONS:

- Air & Gas Washing
- Dust Suppression
- Spray Ponds
- Cooling Tunnels
- Medical Treatment
- Humidification

Spray Angle	MODEL NUMBER	Pipe Size (NPT)	Orifice Dia. (inches)	Dimensions		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)															
				"A" (inches)	"L" (inches)	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	100 psi	150 psi	200 psi	250 psi	300 psi			
50°	1/4YH5007	1/4	0.094	9/16 Hex	1 3/16	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	2.21	2.71	3.13	3.5	3.8			
	1/4YH5013	1/4	0.125	9/16 Hex	1 3/16	0.92	1.09	1.30	1.59	1.84	2.25	2.60	3.2	4.1	5.0	5.8	6.5	7.1			
	1/4YH5020	1/4	0.156	9/16 Hex	1 3/16	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.9	6.3	7.7	8.9	10	11			
	3/8YH5030	3/8	0.188	11/16 Hex	2 1/8	2.12	2.51	3.00	3.7	4.2	5.2	6.0	7.3	9.5	11.6	13.4	15	16			
	3/8YH5040	3/8	0.219	11/16 Hex	2 1/8	2.83	3.3	4.0	4.9	5.7	6.9	8.0	9.8	12.6	15	18	20	22			
	3/8YH5053	3/8	0.250	11/16 Hex	2 1/8	3.7	4.4	5.3	6.5	7.5	9.2	10.6	13.0	17	21	24	27	29			
	3/8YH5082	3/8	0.313	11/16 Hex	2 1/8	5.8	6.9	8.2	10.0	11.6	14.2	16.4	20.1	25.9	32	37	41	45			
	1/2YH50120	1/2	0.375	7/8 Hex	2 1/2	8.5	10.0	12.0	14.7	17.0	20.8	24.0	29.4	38	46	54	60	66			
	1/2YH50164	1/2	0.438	7/8 Hex	2 1/2	11.6	13.7	16.4	20.1	23.2	28.4	33	40	52	64	73	82	90			
	3/4YH50210	3/4	0.500	1 1/16 Hex	2 7/8	14.8	17.6	21.0	25.7	29.7	36	42	51	66	81	94	105	115			
	60°	1/4YH6007	1/4	0.094	9/16 Hex	1 3/16	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	2.21	2.71	3.13	3.5	3.8		
		1/4YH6013	1/4	0.125	9/16 Hex	1 3/16	0.92	1.09	1.30	1.59	1.84	2.25	2.60	3.2	4.1	5.0	5.8	6.5	7.1		
1/4YH6020		1/4	0.156	9/16 Hex	1 3/16	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.9	6.3	7.7	8.9	10	11			
3/8YH6030		3/8	0.188	11/16 Hex	2 1/8	2.12	2.51	3.00	3.7	4.2	5.2	6.0	7.3	9.5	11.6	13.4	15	16			
3/8YH6040		3/8	0.219	11/16 Hex	2 1/8	2.83	3.3	4.0	4.9	5.7	6.9	8.0	9.8	12.6	15	18	20	22			
3/8YH6053		3/8	0.250	11/16 Hex	2 1/8	3.7	4.4	5.3	6.5	7.5	9.2	10.6	13.0	17	21	24	27	29			
3/8YH6082		3/8	0.313	11/16 Hex	2 1/8	5.8	6.9	8.2	10.0	11.6	14.2	16.4	20.1	25.9	32	37	41	45			
1/2YH60120		1/2	0.375	7/8 Hex	2 1/2	8.5	10.0	12.0	14.7	17.0	20.8	24.0	29.4	38	46	54	60	66			
1/2YH60164		1/2	0.438	7/8 Hex	2 1/2	11.6	13.7	16.4	20.1	23.2	28.4	33	40	52	64	73	82	90			
3/4YH60210		3/4	0.500	1 1/16 Hex	2 7/8	14.8	17.6	21.0	25.7	29.7	36	42	51	66	81	94	105	115			
1YH60340		1	0.625	1 3/8 Hex	3 11/16	24.0	28.4	34	42	48	59	68	83	108	132	152	170	186			
1YH60470		1	0.750	1 3/8 Hex	3 11/16	33	39	47	58	66	81	94	115	149	182	210	235	257			
90°	1/4YH9007	1/4	0.094	9/16 Hex	1 3/16	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	2.21	2.71	3.13	3.5	3.8			
	1/4YH9013	1/4	0.125	9/16 Hex	1 3/16	0.92	1.09	1.30	1.59	1.84	2.25	2.60	3.2	4.1	5.0	5.8	6.5	7.1			
	1/4YH9020	1/4	0.156	9/16 Hex	1 3/16	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.9	6.3	7.7	8.9	10	11			
	3/8YH9030	3/8	0.188	11/16 Hex	2 1/8	2.12	2.51	3.00	3.7	4.2	5.2	6.0	7.3	9.5	11.6	13.4	15	16			
	3/8YH9040	3/8	0.219	11/16 Hex	2 1/8	2.83	3.3	4.0	4.9	5.7	6.9	8.0	9.8	12.6	15	18	20	22			
	3/8YH9053	3/8	0.250	11/16 Hex	2 1/8	3.7	4.4	5.3	6.5	7.5	9.2	10.6	13.0	17	21	24	27	29			
	3/8YH9082	3/8	0.313	11/16 Hex	2 1/8	5.8	6.9	8.2	10.0	11.6	14.2	16.4	20.1	25.9	32	37	41	45			
	1/2YH90120	1/2	0.375	7/8 Hex	2 1/2	8.5	10.0	12.0	14.7	17.0	20.8	24.0	29.4	38	46	54	60	66			
	1/2YH90164	1/2	0.438	7/8 Hex	2 1/2	11.6	13.7	16.4	20.1	23.2	28.4	33	40	52	64	73	82	90			
	3/4YH90210	3/4	0.500	1 1/16 Hex	2 7/8	14.8	17.6	21.0	25.7	29.7	36	42	51	66	81	94	105	115			
	1YH90340	3/8	0.625	1 3/8 Hex	3 11/16	24.0	28.4	34	42	48	59	68	83	108	132	152	170	186			
	1YH90470	3/8	0.750	1 3/8 Hex	3 11/16	33	39	47	58	66	81	94	115	149	182	210	235	257			
120°	1/4YH12007	1/4	0.094	9/16 Hex	1 3/16	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	2.21	2.71	3.13	3.5	3.8			
	1/4YH12013	1/4	0.125	9/16 Hex	1 3/16	0.92	1.09	1.30	1.59	1.84	2.25	2.60	3.2	4.1	5.0	5.8	6.5	7.1			
	1/4YH12020	1/4	0.156	9/16 Hex	1 3/16	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.9	6.3	7.7	8.9	10	11			
	3/8YH12030	3/8	0.188	11/16 Hex	2 1/8	2.12	2.51	3.00	3.7	4.2	5.2	6.0	7.3	9.5	11.6	13.4	15	16			
	3/8YH12040	3/8	0.219	11/16 Hex	2 1/8	2.83	3.3	4.0	4.9	5.7	6.9	8.0	9.8	12.6	15	18	20	22			
	3/8YH12053	3/8	0.250	11/16 Hex	2 1/8	3.7	4.4	5.3	6.5	7.5	9.2	10.6	13.0	17	21	24	27	29			
	3/8YH12082	3/8	0.313	11/16 Hex	2 1/8	5.8	6.9	8.2	10.0	11.6	14.2	16.4	20.1	25.9	32	37	41	45			
	1/2YH120120	1/2	0.375	7/8 Hex	2 1/2	8.5	10.0	12.0	14.7	17.0	20.8	24.0	29.4	38	46	54	60	66			
	1/2YH120164	1/2	0.438	7/8 Hex	2 1/2	11.6	13.7	16.4	20.1	23.2	28.4	33	40	52	64	73	82	90			
	3/4YH120210	3/4	0.500	1 1/16 Hex	2 7/8	14.8	17.6	21.0	25.7	29.7	36	42	51	66	81	94	105	115			
	1YH120340	1	0.625	1 3/8 Hex	3 11/16	24.0	28.4	34	42	48	59	68	83	108	132	152	170	186			
	1YH120470	1	0.750	1 3/8 Hex	3 11/16	33	39	47	58	66	81	94	115	149	182	210	235	257			

All references to G.P.M. mean U.S. G.P.M.

HOLLOW CONE SPRAY

Spray Angle	MODEL NUMBER	Pipe Size (NPT)	Orifice Dia. (inches)	Dimensions		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													
				"A" (inches)	"L" (inches)	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	100 psi	150 psi	200 psi	250 psi	300 psi	
180°	1/4YH18013	1/4	0.125	9/16 Hex	1 3/16	0.92	1.09	1.30	1.59	1.84	2.25	2.60	3.2	4.1	5.0	5.8	6.5	7.1	
	1/4YH18020	1/4	0.156	9/16 Hex	1 3/16	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.9	6.3	7.7	8.9	10	11	
	3/8YH18030	3/8	0.188	11/16 Hex	2 1/8	2.12	2.51	3.00	3.7	4.2	5.2	6.0	7.3	9.5	11.6	13.4	15	16	
	3/8YH18040	3/8	0.219	11/16 Hex	2 1/8	2.83	3.3	4.0	4.9	5.7	6.9	8.0	9.8	12.6	15	18	20	22	
	3/8YH18053	3/8	0.250	11/16 Hex	2 1/8	3.7	4.4	5.3	6.5	7.5	9.2	10.6	13.0	17	21	24	27	29	
	3/8YH18082	3/8	0.313	11/16 Hex	2 1/8	5.8	6.9	8.2	10.0	11.6	14.2	16.4	20.1	25.9	32	37	41	45	
	1/2YH180180	1/2	0.375	7/8 Hex	2 1/2	8.5	10.0	12.0	14.7	17.0	20.8	24.0	29.4	38	46	54	60	66	
	1/2YH180164	1/2	0.438	7/8 Hex	2 1/2	11.6	13.7	16.4	20.1	23.2	28.4	33	40	52	64	73	82	90	
	3/4YH180210	3/4	0.500	1 1/16 Hex	2 7/8	14.8	17.6	21.0	25.7	29.7	36	42	51	66	81	94	105	115	
	1YH180340	1	0.625	1 3/8 Hex	3 11/16	24.0	28.4	34	42	48	59	68	83	108	132	152	170	186	
	1YH180470	1	0.750	1 3/8 Hex	3 11/16	33	39	47	58	66	81	94	115	149	182	210	235	257	

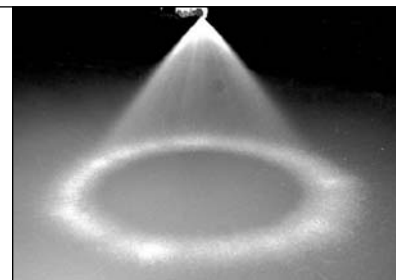
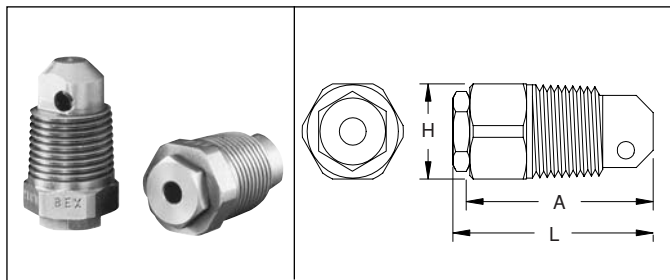
All references to G.P.M. mean U.S. G.P.M.

In-line hollow cone spray nozzles

ILH SERIES

DIMENSIONS

NUMBER	A	L	H
3/8ILH	1.2	1.3	0.75
1/2ILH	1.3	1.5	1
3/4ILH	1.5	1.8	1.2
1 1/2ILH	2.4	2.6	2



SPRAY CHARACTERISTICS:

ILH series in-line hollow-cone spray nozzles produce a very evenly distributed hollow-cone spray which emerges through the center axis of the nozzle body. At lower pressures, they produce medium sized, uniform droplets.

Finer droplets are produced at higher pressures.

CONSTRUCTION:

ILH series nozzles have large maximum free passage diameters to reduce clogging.

Interchangeable nozzle caps are easily removed for cleaning or inspection. Standard materials of construction for ILH series nozzles are brass, 303 and 316 stainless steel. Other body and cap materials are available upon request.

MODEL NUMBER	PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)									
			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi
3/8ILH2	3/8	0.078	--	--	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63
3/8ILH3	3/8	0.094	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95
3/8ILH5	3/8	0.109	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58
3/8ILH8	3/8	0.156	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5
3/8ILH10	3/8	0.116	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2
3/8ILH14	3/8	0.156	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4
1/2ILH5	1/2	0.125	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58
1/2ILH8	1/2	0.156	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5
12ILH10	1/2	0.172	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2
1/2ILH15	1/2	0.172	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7
1/2ILH20	1/2	0.188	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3
1/2ILH25	1/2	0.203	1.77	2.1	2.5	3.1	3.5	4.3	5.0	6.1	7.1	7.9
3/4ILH5	3/4	0.125	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58
3/4ILH8	3/4	0.156	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5
3/4ILH10	3/4	0.172	0.71	0.84	1.00	1.22	1.41	1.73	2.00	2.45	2.83	3.16
3/4ILH15	3/4	0.219	1.06	1.25	1.50	1.84	2.12	2.60	3.00	3.67	4.24	4.74
3/4ILH20	3/4	0.250	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3
3/4ILH25	3/4	0.281	1.77	2.1	2.5	3.1	3.5	4.3	5.0	6.1	7.1	7.9
3/4ILH50	3/4	0.281	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8
1 1/2ILH40	1 1/2	0.313	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6
1 1/2ILH50	1 1/2	0.375	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8
1 1/2ILH70	1 1/2	0.375	4.9	5.9	7.0	8.6	9.9	12.1	14.0	17.1	19.8	22
1 1/2ILH90	1 1/2	0.375	6.4	7.5	9.0	11.0	12.7	15.6	18.0	22	25	28
1 1/2ILH110	1 1/2	0.375	7.8	9.2	11.0	13.5	15.6	19.1	22	27	31	35

TYPICAL APPLICATIONS:

- Dust Suppression
- Spray Ponds
- Metal Treatment
- Roof Cooling
- Brine Spraying
- Humidification
- Aerating

Spray Angle is standard 75 degrees at 40 p.s.i.

Some Wide-Angle models also available. Contact BEX.

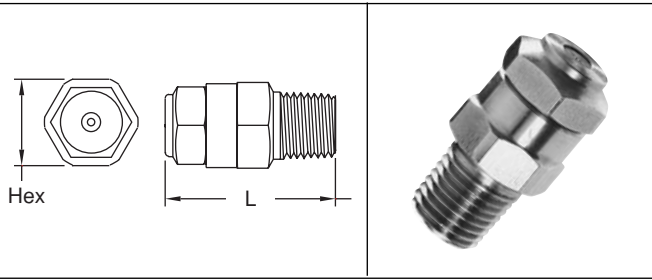
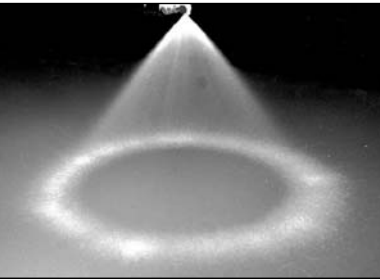
HOLLOW CONE SPRAY

"- -" means not recommended at this pressure.

All references to G.P.M. mean U.S. G.P.M.

C SERIES

Hydraulic atomizing nozzles



DIMENSIONS

NOZZLE TYPE	"L"	BODY	CAP
1/4FCL	1 ¹⁵ / ₁₆	13 ¹ / ₁₆ HEX	11 ¹ / ₁₆ HEX
1/4CL	2 ¹ / ₈	13 ¹ / ₁₆ HEX	11 ¹ / ₁₆ HEX
1/4FCM.5L	1 ⁷ / ₈	13 ¹ / ₁₆ HEX	5 ⁵ / ₈ HEX
1/4CM.5L	2 ¹ / ₃₂	13 ¹ / ₁₆ HEX	5 ⁵ / ₈ HEX
1/4FC	1 ¹⁵ / ₁₆	11 ¹ / ₁₆ HEX	11 ¹ / ₁₆ HEX
1/4C	1 ¹³ / ₃₂	11 ¹ / ₁₆ HEX	11 ¹ / ₁₆ HEX
1/4CC	2 ⁷ / ₃₂	9 ⁹ / ₁₆ HEX	N/A

SPRAY CHARACTERISTICS:

C series hydraulic atomizing nozzles are designed and precision machined to provide a very fine hollow-cone spray using only the liquid pressure for atomizing.

CONSTRUCTION:

Several different styles of nozzle are available in brass, 303 and 316 stainless steel. The orifice insert, core, and strainer are supplied in 316 stainless steel standard.

TYPICAL APPLICATIONS:

- Humidification/Moisture Addition
- Evaporative Cooling
- Steam De-superheating

SPECIAL FEATURES:

- Very fine hollow-cone spray
- Easy disassembly/assembly and cleaning
- Wide range of style and sizes



CL STYLE

Two-piece body with removable cap, orifice, insert, core, core retainer and strainer.



C STYLE

Two piece body with removable cap, orifice insert, core and core retainer.



CM.5L STYLE

1/2" NPT male wall mount body with removable cap, orifice insert, core, core retainer and strainer.



CC STYLE*

One-piece body with removable orifice insert, core and core retainer. (Add "L" for optional external strainer.)

Standard spray angle is 80° @ 40 p.s.i. (80° @ 100 p.s.i. for Models C4.7 and smaller)

MODEL NUMBER							CAPACITY (GPH) AT VARIOUS PRESSURES (psi)									
'CL' Style		'CM.5L' Style		'C' Style		'CC' Style	30 psi	40 psi	80 psi	100 psi	200 psi	300 psi	500 psi	700 psi	1000 psi	
FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	MALE										
1/4FC1.9L	1/4C1.9L	1/4FC1.9M.5L	1/4C1.9M.5L	1/4FC1.9	1/4C1.9	1/4CC1.9	0.51	0.59	0.83	0.93	1.32	1.61	2.1	2.5	2.9	
1/4FC2.4L	1/4C2.4L	1/4FC2.4M.5L	1/4C2.4M.5L	1/4FC2.4	1/4C2.4	1/4CC2.4	0.64	0.74	1.05	1.18	1.67	2.0	2.6	3.1	3.7	
1/4FC3.0L	1/4C3.0L	1/4FC3.0M.5L	1/4C3.0M.5L	1/4FC3.0	1/4C3.0	1/4CC3.0	0.81	0.93	1.32	1.47	2.1	2.5	3.3	3.9	4.7	
1/4FC3.8L	1/4C3.8L	1/4FC3.8M.5L	1/4C3.8M.5L	1/4FC3.8	1/4C3.8	1/4CC3.8	1.02	1.18	1.67	1.86	2.6	3.2	4.2	4.9	5.9	
1/4FC4.7L	1/4C4.7L	1/4FC4.7M.5L	1/4C4.7M.5L	1/4FC4.7	1/4C4.7	1/4CC4.7	1.26	1.46	2.1	2.3	3.3	4.0	5.2	6.1	7.3	
1/4FC5.9L	1/4C5.9L	1/4FC5.9M.5L	1/4C5.9M.5L	1/4FC5.9	1/4C5.9	1/4CC5.9	1.59	1.83	2.6	2.9	4.1	5.0	6.5	7.7	9.2	
1/4FC7.4L	1/4C7.4L	1/4FC7.4M.5L	1/4C7.4M.5L	1/4FC7.4	1/4C7.4	1/4CC7.4	1.99	2.3	3.2	3.6	5.1	6.3	8.1	9.6	11.5	
1/4FC9.2L	1/4C9.2L	1/4FC9.2M.5L	1/4C9.2M.5L	1/4FC9.2	1/4C9.2	1/4CC9.2	2.5	2.9	4.0	4.5	6.4	7.8	10.1	11.9	14.3	
1/4FC12L	1/4C12L	1/4FC12M.5L	1/4C12M.5L	1/4FC12	1/4C12	1/4CC12	3.2	3.7	5.3	5.9	8.3	10.2	13.2	15.6	18.6	
1/4FC14L	1/4C14L	1/4FC14M.5L	1/4C14M.5L	1/4FC14	1/4C14	1/4CC14	3.8	4.3	6.1	6.9	9.7	11.9	15.4	18.2	22	
1/4FC18L	1/4C18L	1/4FC18M.5L	1/4C18M.5L	1/4FC18	1/4C18	1/4CC18	4.8	5.6	7.9	8.8	12.5	15.3	19.7	23	28	
1/4FC23L	1/4C23L	1/4FC23M.5L	1/4C23M.5L	1/4FC23	1/4C23	1/4CC23	6.18	7.1	10.1	11.3	16.0	19.5	25	30	36	
1/4FC28L	1/4C28L	1/4FC28M.5L	1/4C28M.5L	1/4FC28	1/4C28	1/4CC28	7.5	8.7	12.3	13.7	19.4	24	31	36	43	
1/4FC35L	1/4C35L	1/4FC35M.5L	1/4C35M.5L	1/4FC35	1/4C35	1/4CC35	9.4	10.9	15.4	17.2	24	30	38	45	54	
1/4FC44L	1/4C44L	1/4FC44M.5L	1/4C44M.5L	1/4FC44	1/4C44	1/4CC44	11.8	13.7	19.3	22	31	37	48	57	68	
1/4FC55L	1/4C55L	1/4FC55M.5L	1/4C55M.5L	1/4FC55	1/4C55	1/4CC55	14.8	17.1	24	27	38	47	60	71	85	
1/4FC69L	1/4C69L	1/4FC69M.5L	1/4C69M.5L	1/4FC69	1/4C69	1/4CC69	18.5	21	30	34	48	59	76	90	107	
1/4FC86L	1/4C86L	1/4FC86M.5L	1/4C86M.5L	1/4FC86	1/4C86	1/4CC86	23	27	38	42	60	73	94	112	133	

*Some 1/8 NPT CC Styles are available

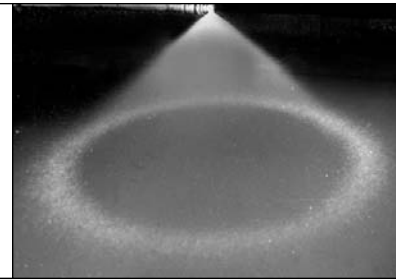
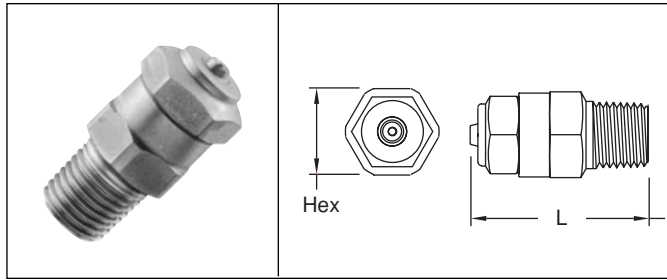
HOLLOW CONE SPRAY

Wide angle hydraulic atomizing nozzles

CW SERIES

DIMENSIONS

NOZZLE TYPE	"L"	BODY	CAP
1/4FCWL	2	13/16 HEX	11/16 HEX
1/4CWL	2 3/16	13/16 HEX	11/16 HEX
1/4FCWM.5L	1 15/16	13/16 HEX	5/8 HEX
1/4CWM.5L	2 3/32	13/16 HEX	5/8 HEX
1/4FCW	2	11/16 HEX	11/16 HEX
1/4CW	1 15/32	11/16 HEX	11/16 HEX
1/4CCW	2 9/32	9/16 HEX	N/A



SPRAY CHARACTERISTICS:

CW series wide angle hydraulic atomizing nozzles are precision machined to provide a very fine wide angle hollow-cone spray using only the liquid pressure for atomizing.

TYPICAL APPLICATIONS:

- Humidification/Moisture Addition
- Evaporative Cooling
- Steam De-superheating

CONSTRUCTION:

Several different styles of nozzle are available in brass, 303 and 316 stainless steel. The orifice insert, core and strainer are supplied in 316 stainless steel standard.

SPECIAL FEATURES:

- Very fine wide angle hollow-cone spray
- Easy disassembly/assembly and cleaning
- Wide range of styles and sizes



CWL STYLE

Two-piece body with removable cap, orifice insert, core, core retainer and strainer.



CW STYLE

Two-piece body with removable cap, orifice insert, core and core retainer.



CWM.5L STYLE

1/2" NPT male wallmount body with removable cap, orifice insert, core, core retainer, and strainer.



CCW STYLE*

One-piece body with removable orifice insert, core and core retainer. (Add "L" for optional external strainer.)

Standard spray angle is 150° @ 40 p.s.i.

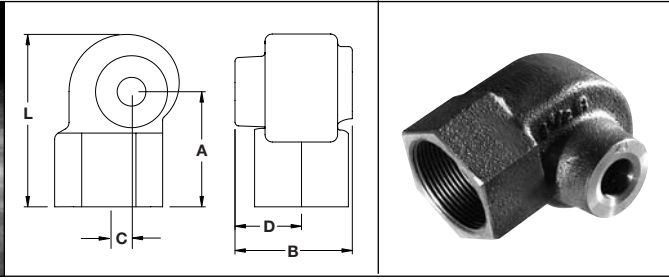
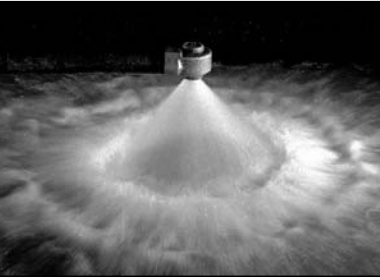
MODEL NUMBER							CAPACITY (GPH) AT VARIOUS PRESSURES (psi)								
'CWL' Style		'CWM.5L' Style		'CW' Style		'CCW' Style	30 psi	40 psi	80 psi	100 psi	200 psi	300 psi	500 psi	700 psi	1000 psi
FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	MALE									
1/4FC5.9WL	1/4C5.9WL	1/4FC5.9WM.5L	1/4C5.9WM.5L	1/4FC5.9W	1/4C5.9W	1/4CC5.9W	1.59	1.83	2.6	2.9	4.1	5.0	6.5	7.7	9.2
1/4FC7.4WL	1/4C7.4WL	1/4FC7.4WM.5L	1/4C7.4WM.5L	1/4FC7.4W	1/4C7.4W	1/4CC7.4W	1.99	2.3	3.2	3.6	5.1	6.3	8.1	9.6	11.5
1/4FC9.2WL	1/4C9.2WL	1/4FC9.2WM.5L	1/4C9.2WM.5L	1/4FC9.2W	1/4C9.2W	1/4CC9.2W	2.5	2.9	4.0	4.5	6.4	7.8	10.1	11.9	14.3
1/4FC12WL	1/4C12WL	1/4FC12WM.5L	1/4C12WM.5L	1/4FC12W	1/4C12W	1/4CC12W	3.2	3.7	5.3	5.9	8.3	10.2	13.2	15.6	18.6
1/4FC14WL	1/4C14WL	1/4FC14WM.5L	1/4C14WM.5L	1/4FC14W	1/4C14W	1/4CC14W	3.8	4.3	6.1	6.9	9.7	11.9	15.4	18.2	22
1/4FC18WL	1/4C18WL	1/4FC18WM.5L	1/4C18WM.5L	1/4FC18W	1/4C18W	1/4CC18W	4.8	5.6	7.9	8.8	12.5	15.3	19.7	23	28
1/4FC23WL	1/4C23WL	1/4FC23WM.5L	1/4C23WM.5L	1/4FC23W	1/4C23W	1/4CC23W	6.18	7.1	10.1	11.3	16.0	19.5	25	30	36
1/4FC28WL	1/4C28WL	1/4FC28WM.5L	1/4C28WM.5L	1/4FC28W	1/4C28W	1/4CC28W	7.5	8.7	12.3	13.7	19.4	24	31	36	43

*Some 1/8 N.P.T. CCW Styles are available

HOLLOW CONE SPRAY

R SERIES

High capacity hollow cone spray nozzles



At 15 p.s.i.: Circular distribution with larger flow rates.

DIMENSIONS

MODEL NUMBER	Dim. A	Dim. B	Dim. C	Dim. D	Dim. L
1R	2	2 ¹ / ₈	1 ¹ / ₈	1 ¹ / ₈	2 ³ / ₄
1 ¹ / ₄ R	2 ¹ / ₈	2 ¹ / ₄	1 ¹ / ₂	1 ¹ / ₄	3 ¹ / ₈
1 ¹ / ₂ R	2 ³ / ₈	3	9 ¹ / ₁₆	1 ³ / ₄	3 ³ / ₄
2R	2 ³ / ₄	3 ⁷ / ₈	1	2 ¹ / ₄	4 ³ / ₄
2 ¹ / ₂ R	3 ¹ / ₂	4 ³ / ₄	1 ¹ / ₈	2 ³ / ₄	4 ³ / ₄

SPRAY CHARACTERISTICS:

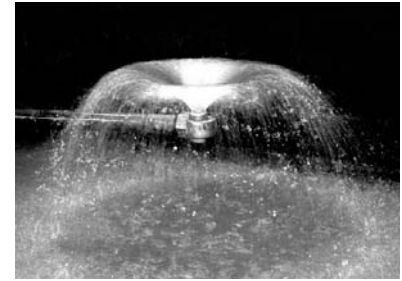
A high capacity hollow cone spray pattern with uniform distribution. The large body and orifice diameters minimize clogging.

CONSTRUCTION:

One piece cast construction. Standard material is 316 stainless steel. All the R series nozzles have a female NPT pipe connection. Bronze and cast iron available on a limited, special order basis.

TYPICAL APPLICATIONS:

- Aeration & Pollution Control
- Cooling Ponds
- Scrubbing and Washing Gases and Fumes
- Cooling Coil
- Dust Proofing
- Chemical Processes



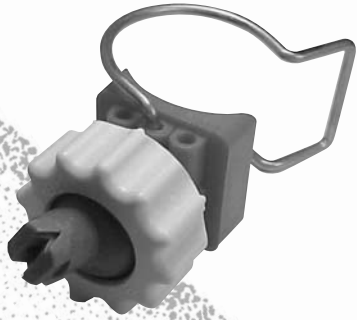
At 1 p.s.i.: Wide spray angle with large droplets and minimal misting.

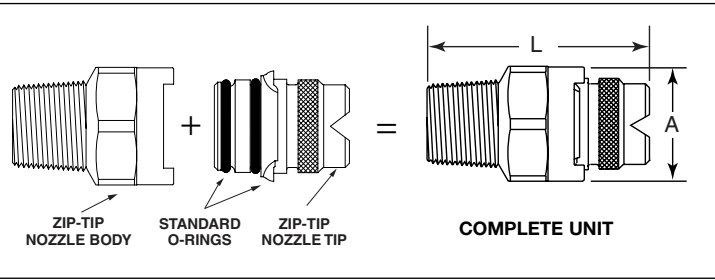
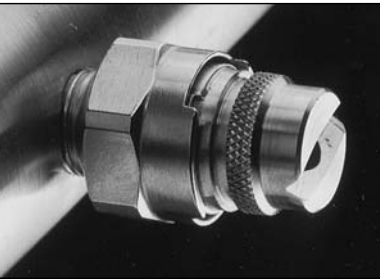
HOLLOW CONE SPRAY

MODEL NUMBER	PIPE SIZE NPT	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY ANGLE @		
			2 psi	3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	7 psi	20 psi	60 psi
1R10	1	1 ¹ / ₂	4.5	5.5	7.1	8.4	10.0	12.2	14.1	17.3	20	24	28	32	65°	72°	73°
1R12	1	1 ⁷ / ₃₂	5.4	6.6	8.5	10.0	12.0	14.7	17.0	21	24	29	34	38	71°	74°	75°
1R14	1	9 ¹ / ₁₆	6.3	7.7	9.9	11.7	14.0	17.1	19.8	24	28	34	40	44	74°	79°	80°
1R16	1	9 ¹ / ₁₆	7.2	8.8	11.3	13.4	16.0	19.6	23	28	32	39	45	51	77°	83°	83°
1R18	1	9 ¹ / ₁₆	8.0	9.9	12.7	15.1	18.0	22	25	31	36	44	51	57	80°	86°	76°
1 ¹ / ₄ R12	1 ¹ / ₄	1 ⁷ / ₃₂	5.4	6.6	8.5	10.0	12.0	14.7	17.0	21	24	29	34	38	64°	68°	69°
1 ¹ / ₄ R14	1 ¹ / ₄	9 ¹ / ₁₆	6.3	7.7	9.9	11.7	14.0	17.1	19.8	24	28	34	40	44	66°	71°	71°
1 ¹ / ₄ R16	1 ¹ / ₄	5 ⁵ / ₈	7.2	8.8	11.3	13.4	16.0	19.6	23	28	32	39	45	51	71°	75°	75°
1 ¹ / ₄ R18	1 ¹ / ₄	5 ⁵ / ₈	8.0	9.9	12.7	15.1	18.0	22	25	31	36	44	51	57	76°	78°	79°
1 ¹ / ₄ R21	1 ¹ / ₄	5 ⁵ / ₈	9.4	11.5	14.8	17.6	21	26	30	36	42	51	59	66	79°	82°	82°
1 ¹ / ₄ R24	1 ¹ / ₄	5 ⁵ / ₈	10.7	13.1	17.0	20	24	29	34	42	48	59	68	76	81°	76°	86°
1 ¹ / ₂ R18	1 ¹ / ₂	5 ⁵ / ₈	8.0	9.9	12.7	15.1	18.0	22	25	31	36	44	51	57	66°	70°	71°
1 ¹ / ₂ R21	1 ¹ / ₂	1 ¹¹ / ₁₆	9.4	11.5	14.8	17.6	21	26	30	36	42	51	59	66	70°	74°	74°
1 ¹ / ₂ R24	1 ¹ / ₂	3 ³ / ₄	10.7	13.1	17.0	20	24	29	34	42	48	59	68	76	73°	76°	76°
1 ¹ / ₂ R28	1 ¹ / ₂	3 ³ / ₄	12.5	15.3	19.8	23	28	34	40	48	56	69	79	89	76°	79°	80°
1 ¹ / ₂ R32	1 ¹ / ₂	3 ³ / ₄	14.3	17.5	23	27	32	39	45	55	64	78	91	101	79°	84°	84°
1 ¹ / ₂ R37	1 ¹ / ₂	3 ³ / ₄	16.5	20	26	31	37	45	52	64	74	91	105	117	84°	88°	88°
2R37	2	7 ⁷ / ₈	16.5	20	26	31	37	45	52	64	74	91	105	117	62°	64°	65°
2R43	2	1 ¹⁵ / ₁₆	19.2	24	30	36	43	53	61	74	86	105	122	136	66°	70°	72°
2R49	2	1	21.9	27	35	41	49	60	69	85	98	120	139	155	70°	72°	73°
2R57	2	1 ¹ / ₁₆	25.5	31	40	48	57	70	81	99	114	140	161	180	74°	77°	77°
2R65	2	1 ¹ / ₁₆	29.1	36	46	54	65	80	92	113	130	159	184	206	75°	79°	79°
2R75	2	1 ¹ / ₁₆	33.5	41	53	63	75	92	106	130	150	184	212	237	78°	81°	81°
2R86	2	1 ¹ / ₁₆	38.5	47	61	72	86	105	122	149	172	211	243	272	86°	88°	88°
2 ¹ / ₂ R75	2 ¹ / ₂	1 ⁹ / ₁₆	33.5	41	53	63	75	92	106	130	150	184	212	237	67°	72°	72°
2 ¹ / ₂ R86	2 ¹ / ₂	1 ⁵ / ₁₆	38.5	47	61	72	86	105	122	149	172	211	243	272	73°	76°	76°
2 ¹ / ₂ R100	2 ¹ / ₂	1 ⁵ / ₁₆	44.7	55	71	84	100	122	141	173	200	245	283	316	79°	83°	84°
2 ¹ / ₂ R115	2 ¹ / ₂	1 ⁵ / ₁₆	51.4	63	81	96	115	141	163	199	230	282	325	364	80°	84°	85°
2 ¹ / ₂ R132	2 ¹ / ₂	1 ⁵ / ₁₆	59.0	72	93	110	132	162	187	229	264	323	373	417	82°	87°	87°

All references to G.P.M. mean U.S. G.P.M.

QUICK DISCONNECT NOZZLES





BEX ZIP-TIP® quick-disconnect spray nozzles are designed to allow fast and easy installation and removal of spray nozzle tips and adapter fittings, while providing positive alignment between nozzle body and nozzle tip. No tools are required to install or remove ZIP-TIP nozzle tips or adapters. Installation involves simply inserting a ZIP-TIP nozzle tip into a ZIP-TIP nozzle body, pressing lightly, and twisting in a clockwise direction until the nozzle tip or adapter snaps into aligned position. ZIP-TIP nozzles utilize standard

“O-ring” seals, where the “O-rings” are located on, and removed with, the nozzle tip. These seals are supplied with each new spray nozzle tip or adapter fitting. Any “Z” series (e.g. “ZF”), ZIP-TIP nozzle tip or adapter will fit any “Z” series ZIP-TIP nozzle body. Likewise, the “ZL” series (e.g. “ZLF”), ZIP-TIP nozzle tip or adapter for larger capacities will fit any “ZL” series ZIP-TIP nozzle body (note that a minimum pipe size is required for specific capacities). ZIP-TIP nozzles are available in 303 and 316 stainless steel as

well as brass, and all are supplied with VITON® seals standard. Other nozzle tip, nozzle body, and seal materials are available upon request. A wide range of styles and capacities of ZIP-TIP nozzle tips and nozzle bodies for flat, full-cone, and hollow-cone spray patterns are available. ZIP-TIP spray nozzles are rated to 300 psi. (NOTE: Metal and molded plastic ZIP-TIP components are not interchangeable).

U.S. Patent No. 5,421,522

ZIP-TIP NOZZLE INSTALLATION & REMOVAL

- NO TOOLS REQUIRED for ZIP-TIP nozzle tip installation or removal
- POSITIVE ALIGNMENT of spray pattern
- “Light-lock” feature allows for easy removal
- Seals located on and removed with nozzle tip for easy flushing
- New seals supplied with each new nozzle tip (VITON® standard)
- Uses standard “O-RING” seals, available in a variety of materials
- High flow capacities in a small assembly size



ZIP-TIP BODIES AND ADAPTERS



ZBD, ZLBD
1/8" - 3/4" NPT Male Only
Brass, 303 & 316 SS



ZAJ, ZLAJ
1/8" - 1/2" NPT Male Only
Brass, 303 & 316 SS



ZTA, ZLTA
1/8" - 1/2" NPT Female Only
Brass, 303 & 316 SS



ZPLUG, ZLPLUG
To shut off individual nozzles
Brass, 303 & 316 SS

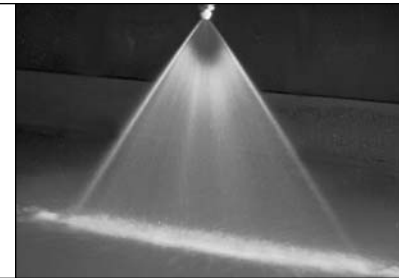
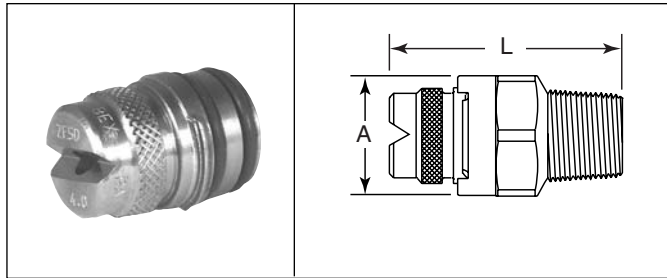
QUICK DISCONNECT

Flat "V" spray nozzles

ZF SERIES

DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8 ZF	1.60	0.97
1/4 ZF	1.70	0.97
3/8 ZF	1.73	0.97
1/2 ZF	1.80	0.97
3/8 ZLF	2.11	1.25
1/2 ZLF	2.19	1.25



SPRAY CHARACTERISTICS:

ZF-Series spray nozzles produce a flat, fan-shaped spray pattern with spray angles available from 15° to 110° measured at 40 psi. Spray angles generally increase with pressure, as shown in the capacity table.

Spray density tapers off toward the outside of these sprays, to permit overlapping of spray patterns while maintaining uniform spray density.

CONSTRUCTION:

The tip models listed are machined from bar stock and are one piece construction. Standard materials are brass, mild steel, 303 stainless steel and 316 stainless steel. Some models are also stocked in Carpenter 20®, PVC, CPVC and polypropylene. All bodies are available in either NPT or BSPT threads. Please see page 55 for molded plastic models.

TYPICAL APPLICATIONS:

Suitable for a variety of washing and spraying applications.

- Parts Cleaning
- Metal Washing
- Foam Control
- Asphalt Spraying
- Gravel Washing
- Vehicle Washing
- Fertilizer Spraying
- Dishwashers

	ZF MODEL	ZLF MODEL		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @			
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi	
110°	ZF11003		.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	92°	110°	118°	
	ZF11004		.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	90°	110°	112°	
	ZF11005		.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	96°	110°	114°	
	ZF11006		.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	97°	110°	115°	
	ZF11008		.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.19	100°	110°	115°	
	ZF11010		.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.74	102°	110°	115°	
	ZF11015		.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.12	2.37	2.90	4.1	102°	110°	115°	
	ZF11020		.105	0.71	0.84	1.00	1.22	1.41	1.73	2.00	2.24	2.45	2.83	3.2	3.9	5.5	103°	110°	112°	
	ZF11030		.129	1.06	1.25	1.50	1.84	2.12	2.60	3.00	3.4	3.7	4.2	4.7	5.8	8.2	103°	110°	115°	
	ZF11040		.149	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	103°	110°	115°	
	ZF11050		.167	1.77	2.09	2.50	3.06	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	107°	110°	116°	
	ZF11060		.182	2.12	2.51	3.00	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	103°	110°	115°	
	ZF11070		.197	2.47	2.93	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	107°	110°	115°	
		ZLF11080		.211	2.83	3.35	4.0	4.9	5.7	6.9	8.0	8.9	9.8	11.3	12.6	15.5	21.9	107°	110°	115°
		ZLF110100		.236	3.54	4.18	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27.4	106°	110°	115°
		ZLF110120		.258	4.24	5.02	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23.2	32.9	108°	110°	117°
	ZLF110150		.289	5.30	6.27	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21.2	23.7	29.0	41	104°	110°	115°	
	ZLF110200		.333	7.07	8.37	10.0	12.2	14.1	17.3	20.0	22.4	24.5	28.3	32	39	55	106°	110°	116°	
	ZLF110400		.471	14.1	16.7	20.0	24.5	28.3	35	40	45	49	57	63	78	110	105°	110°	115°	
95°	ZF9503		.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	86°	95°	101°	
	ZF9504		.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	86°	95°	101°	
	ZF9505		.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	86°	95°	101°	
	ZF9506		.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	86°	95°	101°	
	ZF9508		.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	86°	95°	100°	
	ZF9510		.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	88°	95°	99°	
	ZF9515		.091	0.53	0.63	0.75	0.92	1.06	1.30	1.5	1.68	1.84	2.1	2.4	2.9	4.1	90°	95°	100°	
	ZF9520		.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	89°	95°	99°	
	ZF9530		.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	90°	95°	101°	
	ZF9540		.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	90°	95°	100°	
	ZF9550		.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	91°	95°	101°	
	ZF9560		.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	92°	95°	102°	
	ZF9570		.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	92°	95°	103°	
		ZLF9580		.211	2.8	3.3	4.0	4.9	5.7	6.9	8.0	8.9	9.8	11.3	12.6	15.5	21.9	92°	95°	103°
		ZLF95100		.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	92°	95°	103°
		ZLF95120		.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23.2	32.9	92°	95°	103°
	ZLF95150		.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	92°	95°	102°	

All references to G.P.M. mean U.S. G.P.M.

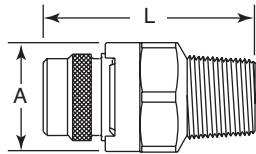
ZF SERIES

Flat "V" spray nozzles continued

SPRAY ANGLE @ 40psi	ZF MODEL	ZLF MODEL	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @			
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi	
15°	ZF1505		.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	10°	15°	20°	
	ZF1506		.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	11°	15°	24°	
	ZF1508		.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	11°	15°	21°	
	ZF1510		.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	13°	15°	16°	
	ZF1515		.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	11°	15°	20°	
	ZF1520		.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	11°	15°	20°	
	ZF1530		.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	11°	15°	18°	
	ZF1540		.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	12°	15°	18°	
	ZF1550		.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	12°	15°	19°	
	ZF1560		.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	12°	15°	17°	
	ZF1570		.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	12°	15°	19°	
		ZLF1580		.211	2.83	3.3	4.0	4.9	5.7	6.9	8.0	8.9	9.8	11.3	12.6	15.5	21.9	12°	15°	19°
		ZLF15100		.236	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	19.4	27	12°	15°	19°
	ZLF15120		.258	4.2	5.0	6.0	7.3	8.5	10.4	12.0	13.4	14.7	17.0	19.0	23	33	12°	15°	19°	
	ZLF15150		.289	5.3	6.3	7.5	9.2	10.6	13.0	15.0	16.8	18.4	21	24	29	41	12°	15°	18°	
	ZLF15200		.333	7.1	8.4	10.0	12.2	14.1	17.3	20	22	24	28	32	39	55	13°	15°	17°	
5°	ZF0505		.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	10°	15°	20°	
	ZF0506		.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	11°	15°	24°	
	ZF0508		.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	11°	15°	21°	
	ZF0510		.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	13°	15°	16°	
	ZF0515		.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.1	2.4	2.9	4.1	11°	15°	20°	
	ZF0520		.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	11°	15°	20°	
	ZF0530		.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	11°	15°	18°	
	ZF0540		.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	12°	15°	18°	

ZF SERIES

Solid stream spray nozzles



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8 ZF	1.60	0.97
1/4 ZF	1.70	0.97
3/8 ZF	1.73	0.97
1/2 ZF	1.80	0.97
3/8 ZLF	2.11	1.25
1/2 ZLF	2.19	1.25

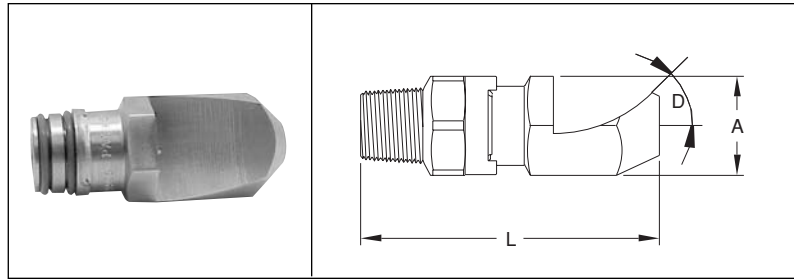
QUICK DISCONNECT

SPRAY ANGLE @ 40psi	ZF STYLE	ZLF STYLE	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													SPRAY ANGLE @		
				5 psi	7 psi	10 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	200 psi	300 psi	20 psi	40 psi	80 psi		
0°	ZF0002		.034	0.07	0.08	0.10	0.14	0.17	0.20	0.24	0.28	0.32	0.45	0.55	0° Solid Stream				
	ZF0003		.041	0.11	0.13	0.15	0.21	0.26	0.30	0.37	0.42	0.47	0.67	0.82					
	ZF0004		.047	0.14	0.17	0.20	0.28	0.35	0.40	0.49	0.57	0.63	0.89	1.10					
	ZF0005		.053	0.18	0.21	0.25	0.35	0.43	0.50	0.61	0.71	0.79	1.12	1.37					
	ZF0006		.058	0.21	0.25	0.30	0.42	0.52	0.60	0.73	0.85	0.95	1.34	1.64					
	ZF0008		.067	0.28	0.33	0.40	0.57	0.69	0.80	0.98	1.13	1.26	1.79	2.2					
	ZF0010		.075	0.35	0.42	0.50	0.71	0.87	1.00	1.22	1.41	1.58	2.2	2.7					
	ZF0015		.091	0.53	0.63	0.75	1.06	1.30	1.50	1.84	2.1	2.4	3.4	4.1					
	ZF0020		.105	0.71	0.84	1.00	1.41	1.73	2.0	2.4	2.8	3.2	4.5	5.5					
	ZF0030		.129	1.06	1.25	1.50	2.1	2.6	3.0	3.7	4.2	4.7	6.7	8.2					
	ZF0040		.149	1.41	1.67	2.0	2.8	3.5	4.0	4.9	5.7	6.3	8.9	11.0					
	ZF0050		.167	1.77	2.1	2.5	3.5	4.3	5.0	6.1	7.1	7.9	11.2	13.7					
	ZF0060		.182	2.1	2.5	3.0	4.2	5.2	6.0	7.3	8.5	9.5	13.4	16.4					
	ZF0070		.197	2.5	2.9	3.5	4.9	6.1	7.0	8.6	9.9	11.1	15.7	19.2					
		ZLF0080		.211	2.8	3.3	4.0	5.7	6.9	8.0	9.8	11.3	12.6	17.9		22			
		ZLF00100		.236	3.5	4.2	5.0	7.1	8.7	10.0	12.2	14.1	15.8	22		27			
		ZLF00120		.258	4.2	5.0	6.0	8.5	10.4	12.0	14.7	17.0	19.0	27		33			
	ZLF00150		.289	5.3	6.3	7.5	10.6	13.0	15.0	18.4	21	24	34	41					
	ZLF00200		.333	7.1	8.4	10.0	14.1	17.3	20.0	24.5	28.3	32	45	55					
	ZLF00400		.471	14.1	16.7	20.0	28.3	35	40	49	57	63	89	110					

All references to G.P.M. mean U.S. G.P.M.

High impact flat spray nozzles

ZFP SERIES



SPRAY CHARACTERISTICS:

A flat and thin fan-shaped spray with sharp definition on all edges. This spray delivers very high impact over the area covered. The spray is deflected by angle D away from the centerline of the spray nozzle.

CONSTRUCTION:

The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel.

TYPICAL APPLICATIONS:

- High Impact Applications
- Metal Wash
- Gravel Washing
- Vehicle Washing

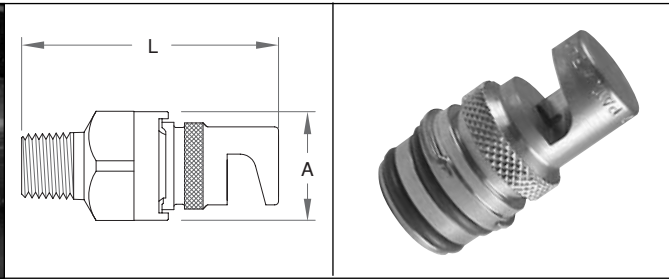
SPRAY ANGLE @ 40psi	ZFP MODEL	ZLFP MODEL	ORIFICE DIA. (inches)	ANGLE 'D' @ 40psi	Dimensions (inches)		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @		
					'A'	'L'	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	15 psi	40 psi	100 psi		
50°	ZFP5001		.024	40°	1.13	1.70	0.06	0.07	0.09	0.10	0.12	0.14	0.16	0.19	30°	50°	58°		
	ZFP50025		.038	41°	1.13	1.99	0.15	0.18	0.22	0.25	0.31	0.35	0.40	0.48	29°	50°	57°		
	ZFP5005		.053	41°	1.13	2.06	0.31	0.35	0.43	0.50	0.61	0.71	0.79	0.97	30°	50°	59°		
	ZFP5010		.075	52°	1.13	2.19	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	32°	50°	59°		
	ZFP5025		.118	40°	1.13	2.27	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.8	41°	50°	58°		
	ZFP5040		.149	45°	1.13	2.71	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	42°	50°	59°		
	ZFP5060		.183	40°	1.13	3.00	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	41°	50°	52°		
		ZLFP50100		.236	38°	1.44	3.96	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	44°	50°	54°	
		ZLFP50125		.266	34°	1.44	3.96	7.7	8.8	10.8	12.5	15.3	17.7	19.8	24	39°	50°	57°	
		ZLFP50160		.298	37°	1.44	3.96	9.8	11.3	13.9	16.0	19.6	23	25	31	46°	50°	55°	
	ZLFP50200		.328	33°	1.44	4.09	12.2	14.1	17.3	20	24	28	32	39	47°	50°	55°		
40°	ZFP4040		.149	34°	1.13	1.99	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	29°	40°	48°		
	ZFP4050		.167	32°	1.13	2.06	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	30°	40°	47°		
	ZFP4060		.183	31°	1.13	2.06	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	31°	40°	50°		
	ZFP4070		.197	28°	1.13	2.19	4.3	4.9	6.1	7.0	8.6	9.9	11.1	13.6	33°	40°	50°		
		ZLFP4080		.211	28°	1.44	2.51	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	33°	40°	48°	
		ZLFP4090		.228	28°	1.44	2.95	5.5	6.4	7.8	9.0	11.0	12.7	14.2	17.4	34°	40°	46°	
	ZLFP40100		.236	31°	1.44	3.24	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	34°	40°	46°		
35°	ZFP3504		.047	36°	1.13	2.21	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.77	20°	35°	41°		
	ZFP3510		.075	37°	1.13	2.35	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	18°	35°	38°		
	ZFP3520		.105	30°	1.13	2.48	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	25°	35°	42°		
	ZFP3525		.117	29°	1.13	2.57	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.8	24°	35°	41°		
	ZFP3530		.128	28°	1.13	2.68	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	25°	35°	42°		
	ZFP3540		.149	31°	1.13	2.90	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	29°	35°	42°		
	ZFP3550		.167	26°	1.13	3.18	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	30°	35°	40°		
	ZFP3560		.183	29°	1.13	3.32	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	27°	35°	40°		
		ZLFP3580		.211	22°	1.44	4.35	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	25°	35°	38°	
		ZLFP35100		.221	24°	1.44	4.67	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	25°	35°	40°	
	ZLFP35160		.295	22°	1.44	5.78	9.8	11.3	13.9	16.0	19.6	23	25	31	26°	35°	39°		
	ZLFP35200		.333	24°	1.44	5.97	12.2	14.1	17.3	20	24	28	32	39	31°	35°	42°		
25°	ZFP2540		.149	24°	1.13	3.38	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	22°	25°	27°		
15°	ZFP1510		.075	22°	1.13	2.93	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	--	15°	21°		
	ZFP1520		.105	16°	1.13	3.28	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	--	15°	18°		
	ZFP1530		.129	20°	1.13	3.85	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	8°	15°	24°		
	ZFP1540		.149	13°	1.13	4.21	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	8°	15°	20°		
	ZFP1550		.167	14°	1.13	4.58	3.1	3.5	4.3	5.0	6.1	7.1	7.9	9.7	8°	15°	22°		
	ZFP1560		.183	14°	1.13	5.87	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	11°	15°	18°		
		ZLFP1580		.218	14°	1.44	6.43	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	11°	15°	18°	
		ZLFP15100		.236	15°	1.44	6.74	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	11°	15°	17°	
		ZLFP15200		.333	15°	1.44	8.87	12.2	14.1	17.3	20	24	28	32	39	11°	15°	17°	
		ZLFP15300		0.408	15°	1.44	8.80	18.4	21	26	30	37	42	47	58	12°	15°	18°	

All references to G.P.M. mean U.S. G.P.M.

QUICK DISCONNECT

ZFL SERIES

Flooding nozzles



SPRAY CHARACTERISTICS:

A wide, flat fan-shaped spray with low impact. The spray is deflected 75° away from the centerline of the pipe connection, as shown.

CONSTRUCTION:

The tip models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models may also be available in other materials.

TYPICAL APPLICATIONS:

Wherever a low impact, wide angle spray is required.

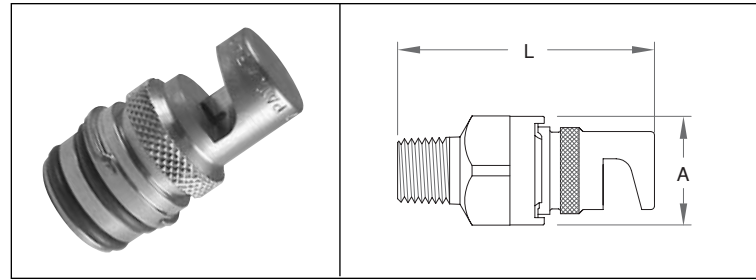
- Rinsing and Cooling
- Dishwashing
- Fertilizer Spraying
- Metal Wash

ZFL MODEL	ZFLT MODEL	ORIFICE DIA. (inches)	DIMENSIONS		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @					
			"A"	"L"	3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	3 psi	5 psi	7 psi	10 psi	20 psi	60 psi	
	ZFLT.25	.017	.970	2.08	--	--	--	0.03	0.03	0.04	0.04	0.05	0.06	--	--	--	90°	106°	120°	
	ZFLT.50	.024	.970	2.08	--	--	0.04	0.05	0.06	0.07	0.09	0.10	0.12	--	--	65°	78°	99°	120°	
	ZFLT.75	.029	.970	2.08	--	--	0.06	0.08	0.09	0.11	0.13	0.15	0.18	--	--	72°	85°	112°	140°	
	ZFLT1	.033	.970	2.08	--	--	0.08	0.10	0.12	0.14	0.17	0.20	0.24	--	--	90°	97°	135°	148°	
	ZFLT1.3	.038	.970	2.08	--	0.09	0.11	0.13	0.16	0.18	0.23	0.26	0.32	--	73°	80°	92°	115°	134°	
	ZFLT1.5	.042	.970	2.08	0.08	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.37	57°	69°	75°	87°	104°	125°	
	ZFLT2	.047	.970	2.08	0.11	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.49	60°	73°	82°	86°	104°	125°	
	ZFLT2.5	.055	.970	2.08	0.14	0.18	0.21	0.25	0.31	0.36	0.44	0.51	0.62	79°	87°	92°	101°	112°	130°	
	ZFLT3	.059	.970	2.08	0.16	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	84°	97°	106°	115°	130°	140°	
ZFL4		.070	.970	2.08	0.22	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.98	74°	87°	89°	101°	116°	127°	
ZFL5		.076	.970	2.18	0.27	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	78°	89°	97°	103°	113°	132°	
ZFL7.5		.094	.970	2.18	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	98°	105°	112°	120°	132°	144°	
ZFL10		.110	.970	2.18	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	116°	125°	135°	137°	144°	150°	
ZFL12		.120	.970	2.18	0.66	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	98°	105°	109°	118°	134°	139°	
ZFL15		.129	.970	2.18	0.82	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	100°	110°	115°	124°	131°	139°	
ZFL18		.147	.970	2.18	0.99	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	100°	112°	116°	124°	135°	137°	
ZFL20		.154	.970	2.18	1.10	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	115°	125°	128°	134°	142°	147°	
ZFL22		.161	.970	2.18	1.20	1.56	1.84	2.2	2.7	3.1	3.8	4.4	5.4	97°	108°	114°	120°	128°	132°	
ZFL24		.169	.970	2.18	1.31	1.70	2.0	2.4	2.9	3.4	4.2	4.8	5.9	106°	118°	121°	127°	136°	154°	
ZFL27		.177	.970	2.18	1.48	1.91	2.3	2.7	3.3	3.8	4.7	5.4	6.6	110°	120°	124°	129°	139°	146°	
ZFL30		.188	.970	2.18	1.64	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	104°	116°	121°	127°	135°	138°	
ZFL35		.196	.970	2.18	1.92	2.5	2.9	3.5	4.3	4.9	6.1	7.0	8.6	104°	114°	118°	126°	130°	137°	
ZFL40		.209	.970	2.18	2.19	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	104°	116°	121°	127°	135°	138°	
ZFL45		.228	.970	2.18	2.46	3.2	3.8	4.5	5.5	6.4	7.8	9.0	11.0	104°	114°	118°	126°	130°	137°	
ZFL60		.266	.970	2.18	3.29	4.2	5.0	6.0	7.3	8.5	10.4	12.0	14.7	110°	120°	124°	126°	130°	135°	

-- means not recommended at this pressure

All references to G.P.M. mean U.S. G.P.M.

QUICK DISCONNECT



SPRAY CHARACTERISTICS:

The FL series spray nozzles may also be used with air or steam, resulting in a deflected curtain of gas extending no more than a few inches away from the nozzle. For most applications, the maximum practical target distance from the nozzle is 10 inches.

CONSTRUCTION:

The models listed are machined from bar stock, and are one piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models may also be available in other materials.

TYPICAL APPLICATIONS:

For dispensing air or steam. Stainless steel construction recommended for steam applications.

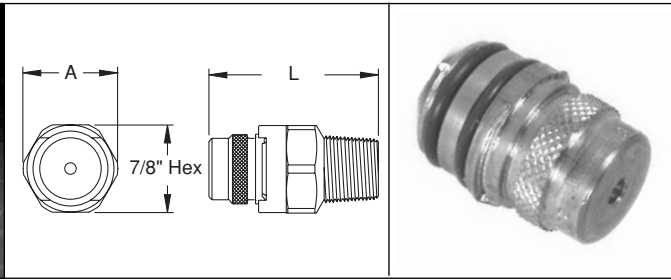
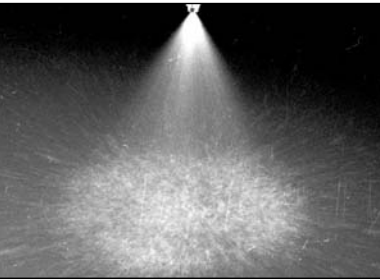
- Cleaning
- Cooling
- Blow-off of Surfaces

ZFL	ZFLT MODEL	ORIFICE DIA. (inches)	DIMENSIONS		AIR CAPACITY (SCFM)					COVERAGE AT 6" DISTANCE FROM THE NOZZLE (inches)	
			"A"	"L"	10 psi	20 psi	40 psi	50 psi	80 psi	10 psi	15 psi
	ZFLT.25	.017	.970	2.08	0.06	0.14	0.22	0.26	0.38	2	4 1/2
	ZFLT.50	.024	.970	2.08	0.11	0.27	0.43	0.50	0.74	2	5
	ZFLT.75	.029	.970	2.08	0.17	0.39	0.61	0.73	1.06	2 1/2	6
	ZFLT1	.033	.970	2.08	0.22	0.51	0.80	0.95	1.39	3	6
	ZFLT1.3	.038	.970	2.08	0.29	0.68	1.07	1.27	1.86	3	6 1/2
	ZFLT1.5	.042	.970	2.08	0.35	0.83	1.31	1.55	2.3	3 1/2	6 1/2
	ZFLT2	.047	.970	2.08	0.44	1.03	1.62	1.92	2.8	3 1/2	7 1/2
	ZFLT2.5	.055	.970	2.08	0.60	1.42	2.2	2.6	3.9	4	7 1/2
	ZFLT3	.059	.970	2.08	0.69	1.63	2.6	3.0	4.4	5	8
ZFL4		.070	.970	2.08	0.98	2.3	3.6	4.3	6.3	5	9
ZFL5		.076	.970	2.18	1.15	2.7	4.3	5.0	7.4	6	10
ZFL7.5		.094	.970	2.18	1.76	4.2	6.6	7.8	11.5	6 1/2	10
ZFL10		.110	.970	2.18	2.40	5.7	9.0	10.6	15.6	7	11
ZFL12		.120	.970	2.18	2.90	6.8	10.7	12.7	18.6	7	11 1/2
ZFL15		.129	.970	2.18	3.50	8.4	13.2	15.7	23	7	12
ZFL18		.147	.970	2.18	4.30	10.3	16.2	19.2	28	8	13
ZFL20		.154	.970	2.18	4.70	11.3	17.8	21	31	8 1/2	14 1/2
ZFL22		.161	.970	2.18	5.2	12.3	19.4	23	34	8 1/2	14 1/2
ZFL24		.169	.970	2.18	5.7	13.6	21	25	37	8 1/2	15
ZFL27		.177	.970	2.18	6.3	14.9	23	28	41	8 1/2	15
ZFL30		.188	.970	2.18	7.1	16.8	26	31	46	8 1/2	15 1/2

QUICK DISCONNECT

ZS SERIES

Full cone spray nozzles



TYPICAL APPLICATIONS:

- Chemical Processing
- Cooling Sprays
- Foam Breaking
- Continuous Casting

SPRAY CHARACTERISTICS:

Full cone spray pattern, with uniform distribution throughout the cone.

susceptible to clogging. Standard materials are brass, 303 stainless steel and 316 stainless steel.

U.S. Patent No. 4,142,682
Canadian Patent No. 1,050,589

CONSTRUCTION:

The nozzle contains a patented insert with larger flow passages than older styles, and is less

ZS SERIES

One piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZS	1.60	0.97
1/4ZS	1.70	0.97
3/8ZS	1.73	0.97
1/2ZS	1.80	0.97
3/8ZLS	2.11	1.25
1/2ZLS	2.19	1.25

ZGS SERIES

Two piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZGS	1.98	0.97
1/4ZGS	2.12	0.97
3/8ZGS	2.56	0.97
1/2ZGS	2.63	0.97
3/8ZLGS	2.79	1.25
1/2ZLGS	2.87	1.25

ZHGS SERIES

Two piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZHGS	2.11	1.48
1/4ZHGS	2.21	1.60
3/8ZHGS	2.24	1.65
1/2ZHGS	2.31	1.80
3/8ZLHGS	2.96	1.71
1/2ZLHGS	3.04	1.86

QUICK DISCONNECT

'ZS' one piece tip	'ZGS' two piece tip		'ZHGS' Right Angle two piece tip		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												Spray Angle @			
	ZGS	ZLGS	ZHGS	ZLHGS		3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi	
ZS1	ZGS1		ZHGS1		.033	--	--	--	--	0.12	0.14	0.17	0.20	0.24	0.28	0.32	0.39	--	55°	52°	
ZS1.5	ZGS1.5		ZHGS1.5		.046	--	--	--	0.15	0.18	0.21	0.26	0.30	0.37	0.42	0.47	0.58	--	65°	57°	
ZS2	ZGS2		ZHGS2		.051	--	--	0.17	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.77	54°	59°	60°	
ZS3	ZGS3		ZHGS3		.051	--	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	1.16	50°	53°	60°	
ZS3.5	ZGS3.5		ZHGS3.5		.051	0.19	0.25	0.29	0.35	0.43	0.49	0.61	0.70	0.86	0.99	1.11	1.36	48°	58°	61°	
ZS5	ZGS5		ZHGS5		.064	0.27	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	60°	75°	70°	
ZS6	ZGS6		ZHGS6		.064	0.33	0.42	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	67°	72°	70°	
ZS6.5	ZGS6.5		ZHGS6.5		.091	0.36	0.46	0.54	0.65	0.80	0.92	1.13	1.30	1.59	1.84	2.1	2.5	48°	56°	50°	
ZS7.5	ZGS7.5		ZHGS7.5		.091	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	2.9	55°	65°	48°	
ZS8.5	ZGS8.5		ZHGS8.5		.091	0.47	0.60	0.71	0.85	1.04	1.20	1.47	1.70	2.1	2.4	2.7	3.3	58°	65°	63°	
ZS10	ZGS10		ZHGS10		.091	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	60°	65°	62°	
ZS14	ZGS14		ZHGS14		.091	0.77	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	78°	85°	75°	
ZS15	ZGS15		ZHGS15		.102	0.82	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	63°	65°	60°	
ZS18	ZGS18		ZHGS18		.102	0.99	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	5.1	5.7	7.0	85°	88°	76°	
ZS20	ZGS20		ZHGS20		.102	1.10	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	76°	82°	75°	
ZS22	ZGS22		ZHGS22		.114	1.20	1.56	1.84	2.2	2.7	3.1	3.8	4.4	5.4	6.2	7.0	8.5	76°	78°	76°	
	ZLS16		ZLGS16		ZLHGS16	.144	0.88	1.13	1.34	1.60	1.96	2.3	2.8	3.2	3.9	4.5	5.1	6.2	55°	60°	55°
	ZLS25		ZLGS25		ZLHGS25	.144	1.37	1.77	2.1	2.5	3.1	3.5	4.3	5.0	6.1	7.1	7.9	68°	73°	65°	
	ZLS32		ZLGS32		ZLHGS32	.144	1.75	2.3	2.7	3.2	3.9	4.5	5.5	6.4	7.8	9.1	10.1	12.4	80°	90°	75°
	ZLS40		ZLGS40		ZLHGS40	.162	2.2	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	86°	90°	81°

All references to G.P.M. mean U.S. G.P.M.

Wide angle full cone spray nozzles

ZSW SERIES

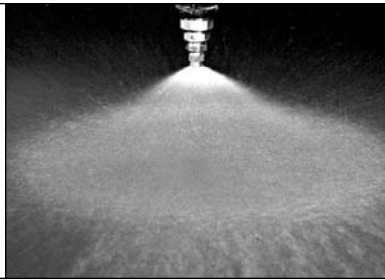
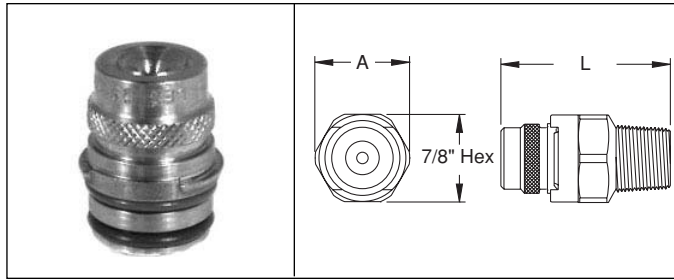
TYPICAL APPLICATIONS:

Anywhere a wide angle full cone spray is required:

- Chemical Processing
- Cooling Sprays
- Continuous Casting

U.S. Patent No. 4,142,682

Canadian Patent No. 1,050,589



SPRAY CHARACTERISTICS:

A wide angle full cone spray pattern, with uniform distribution throughout the cone.

less susceptible to clogging. Standard materials are brass, 303 stainless steel and 316 stainless steel.

CONSTRUCTION:

This nozzle tip contains a patented insert with larger flow passages than older styles, and is

ZSW SERIES

One piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZSW	1.60	0.97
1/4ZSW	1.70	0.97
3/8ZSW	1.73	0.97
1/2ZSW	1.80	0.97
3/8ZLSW	2.11	1.25
1/2ZLSW	2.19	1.25

ZGSW SERIES

Two piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZGSW	1.98	0.97
1/4ZGSW	2.12	0.97
3/8ZGSW	2.56	0.97
1/2ZGSW	2.63	0.97
3/8ZLGSW	2.79	1.25
1/2ZLGSW	2.87	1.25

ZHGSW SERIES

Two piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZHGSW	2.11	1.48
1/4ZHGSW	2.21	1.60
3/8ZHGSW	2.24	1.65
1/2ZHGSW	2.31	1.80
3/8ZLHGSW	2.96	1.71
1/2ZLHGSW	3.04	1.86

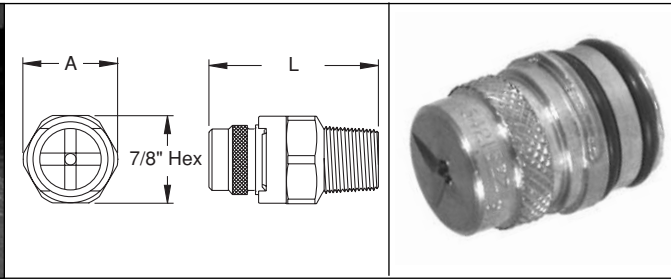
'ZSW' one piece tip	'ZGSW' two piece tip		'ZHGSW' Right Angle two piece tip		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										Spray Angle @			
	ZGSW	ZLGSW	ZHGSW	ZLHGSW		5	7	10	15	20	30	40	60	80	100	150	7	20	80
						psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
ZS2.8W	ZGS2.8W	ZLGS2.8W	ZHGS2.8W	ZLHGS2.8W	.051	--	0.23	0.28	0.34	0.40	0.48	0.56	0.69	0.79	0.89	1.08	110°	105°	96°
ZS4.3W	ZGS4.3W	ZLGS4.3W	ZHGS4.3W	ZLHGS4.3W	.051	--	0.36	0.43	0.53	0.61	0.74	0.86	1.05	1.22	1.36	1.67	117°	108°	100°
ZS5.6W	ZGS5.6W	ZLGS5.6W	ZHGS5.6W	ZLHGS5.6W	.064	--	0.47	0.56	0.69	0.79	0.97	1.12	1.37	1.58	1.77	2.2	117°	110°	100°
ZS8W	ZGS8W	ZLGS8W	ZHGS8W	ZLHGS8W	.081	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5	3.1	118°	110°	103°
ZS10W	ZGS10W	ZLGS10W	ZHGS10W	ZLHGS10W	.091	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	118°	108°	102°
ZS12W	ZGS12W	ZLGS12W	ZHGS12W	ZLHGS12W	.091	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	3.4	3.8	4.6	120°	112°	102°
ZS14W	ZGS14W	ZLGS14W	ZHGS14W	ZLHGS14W	.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	118°	114°	104°
ZS17W	ZGS17W	ZLGS17W	ZHGS17W	ZLHGS17W	.102	1.20	1.42	1.70	2.1	2.4	2.9	3.4	4.2	4.8	5.4	6.6	118°	117°	102°
ZS20W	ZGS20W	ZLGS20W	ZHGS20W	ZLHGS20W	.102	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	120°	120°	106°
ZS24W	ZGS24W	ZLGS24W	ZHGS24W	ZLHGS24W	.102	1.70	2.0	2.4	2.9	3.4	4.2	4.8	5.9	6.8	7.6	9.3	122°	118°	106°
ZS27W	ZGS27W	ZLGS27W	ZHGS27W	ZLHGS27W	.102	1.91	2.3	2.7	3.3	3.8	4.7	5.4	6.6	7.6	8.5	10.5	122°	120°	107°
	ZLS30W	ZLGS30W	ZHGS30W	ZLHGS30W	.144	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	120°	118°	110°
	ZLS35W	ZLGS35W	ZHGS35W	ZLHGS35W	.144	2.5	2.9	3.5	4.3	4.9	6.1	7.0	8.6	9.9	11.1	13.6	122°	118°	108°
	ZLS40W	ZLGS40W	ZHGS40W	ZLHGS40W	.162	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	122°	119°	104°
	ZLS45W	ZLGS45W	ZHGS45W	ZLHGS45W	.162	3.2	3.8	4.5	5.5	6.4	7.8	9.0	11.0	12.7	14.2	17.4	141°	118°	108°

All references to G.P.M. mean U.S. G.P.M.

See pages 2, 3 and 4 for engineering data and spray coverage.

ZSQ SERIES

Full square spray nozzles



SPRAY CHARACTERISTICS:

Full cone spray pattern, with uniform distribution throughout the approximately square cone.

CONSTRUCTION:

Standard materials are brass, 303 and 316 stainless. Larger sizes in cast 316 or 303 stainless bar.

TYPICAL APPLICATIONS:

- Chemical Processing
- Cooling Sprays
- Continuous Casting

U.S. Patent No. 4,142,682
Canadian Patent No. 1,050,589

ZSQ SERIES

One piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZSQ	1.60	0.97
1/4ZSQ	1.70	0.97
3/8ZSQ	1.73	0.97
1/2ZSQ	1.80	0.97
3/8ZLSQ	2.11	1.25
1/2ZLSQ	2.19	1.25

ZGSQ SERIES

Two piece body + removable insert



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZGSQ	1.98	0.97
1/4ZGSQ	2.12	0.97
3/8ZGSQ	2.56	0.97
1/2ZGSQ	2.63	0.97
3/8ZLGSQ	2.79	1.25
1/2ZLGSQ	2.87	1.25

FSQ: Female Connection SQ: Male Connection

FSQ: Female Connection SQ: Male Connection

QUICK DISCONNECT

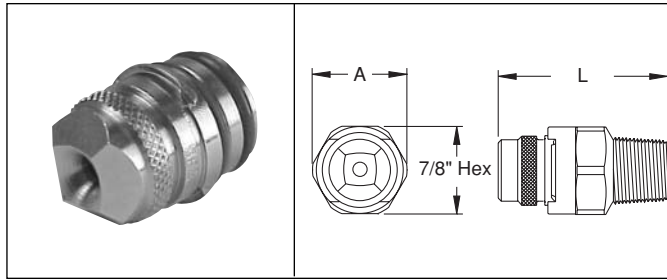
ZSQ one piece tip	ZGSQ two piece tip		ZHGSQ Right Angle two piece tip		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											Spray Angle @		
	ZGSQ	ZLGSQ	ZHGSQ	ZLHGSQ		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi
ZS3.6SQ	ZGS3.6SQ		ZHGS3.6SQ		.057	--	0.30	0.36	0.44	0.51	0.62	0.72	0.88	1.02	1.14	1.39	42 _i	55 _i	50 _i
ZS4.8SQ	ZGS4.8SQ		ZHGS4.8SQ		.064	--	0.40	0.48	0.59	0.68	0.83	0.96	1.18	1.36	1.52	1.86	50 _i	65 _i	60 _i
ZS6SQ	ZGS6SQ		ZHGS6SQ		.081	--	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	30 _i	65 _i	60 _i
ZS10SQ	ZGS10SQ		ZHGS10SQ		.091	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	61 _i	67 _i	60 _i
ZS12SQ	ZGS12SQ		ZHGS12SQ		.091	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	3.4	3.8	4.6	71 _i	76 _i	69 _i
ZS14SQ	ZGS14SQ		ZHGS14SQ		.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	78 _i	85 _i	75 _i
ZS18SQ	ZGS18SQ		ZHGS18SQ		.102	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	5.1	5.7	7.0	70 _i	75 _i	68 _i
	ZLS29SQ	ZLGS29SQ		ZLHGS29SQ	.144	2.1	2.4	2.9	3.6	4.1	5.0	5.8	7.1	8.2	9.2	11.2	70 _i	75 _i	68 _i
	ZLS36SQ	ZLGS36SQ		ZLHGS36SQ	.144	2.5	3.0	3.6	4.4	5.1	6.2	7.2	8.8	10.2	11.4	13.9	80 _i	85 _i	77 _i

All references to G.P.M. mean U.S. G.P.M.

Wide angle full square spray nozzles **ZSWSQ SERIES**

DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZSWSQ	1.60	0.97
1/4ZSWSQ	1.70	0.97
3/8ZSWSQ	1.73	0.97
1/2ZSWSQ	1.80	0.97
3/8ZLSWSQ	2.11	1.25
1/2ZLSWSQ	2.19	1.25



See page 25 for spray characteristics, construction and typical applications.

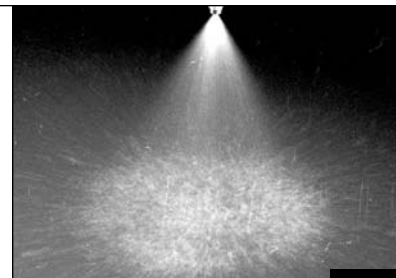
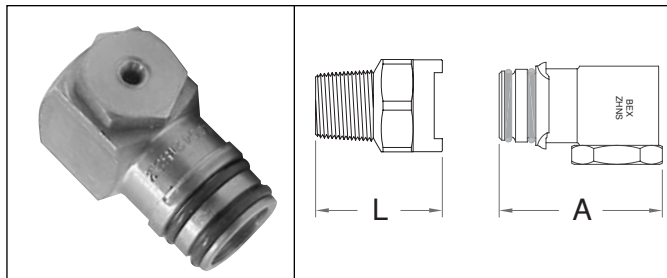
'ZSWSQ' one piece tip		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											Spray Angle @		
ZSWSQ	ZLSWSQ		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi
ZS14WSQ		.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	102 _i	98 _i	84 _i
ZS17WSQ		.102	1.20	1.42	1.70	2.1	2.4	2.9	3.4	4.2	4.8	5.4	6.6	50 _i	94 _i	82 _i
ZS20WSQ		.102	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	60 _i	102 _i	86 _i
ZS24WSQ		.102	1.70	2.0	2.4	2.9	3.4	4.2	4.8	5.9	6.8	7.6	9.3	104 _i	102 _i	86 _i
ZS27WSQ		.102	1.91	2.3	2.7	3.3	3.8	4.7	5.4	6.6	7.6	8.5	10.5	104 _i	102 _i	87 _i
	ZLS30WSQ	.144	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	8.5	9.5	11.6	100 _i	96 _i	85 _i
	ZLS35WSQ	.144	2.5	2.9	3.5	4.3	4.9	6.1	7.0	8.6	9.9	11.1	13.6	104 _i	99 _i	88 _i
	ZLS40WSQ	.162	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6	15.5	106 _i	104 _i	90 _i
	ZLS45WSQ	.162	3.2	3.8	4.5	5.5	6.4	7.8	9.0	11.0	12.7	14.2	17.4	106 _i	104 _i	94 _i
	ZLS50WSQ	.195	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	19.4	108 _i	102 _i	97 _i
	ZLS71WSQ	.195	5.0	5.9	7.1	8.7	10.0	12.3	14.2	17.4	20	22	27	99 _i	102 _i	93 _i

All references to G.P.M. mean U.S. G.P.M.

Vaneless full cone spray nozzles **ZHNS SERIES**

DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZHNS	2.11	1.32
1/4ZHNS	2.21	1.32
3/8ZHNS	2.24	1.32
1/2ZHNS	2.31	1.32



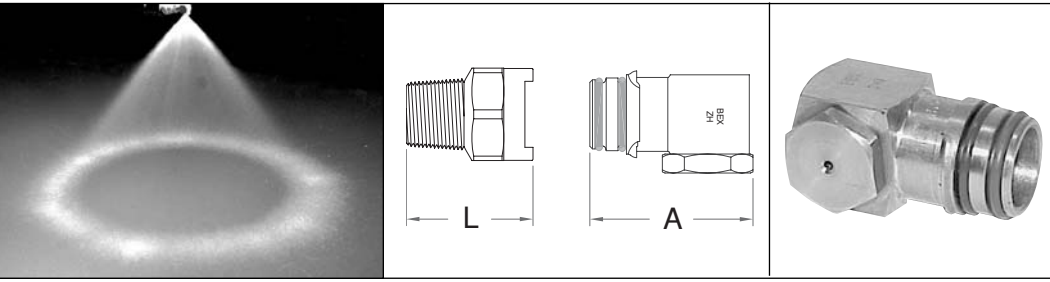
See page 26 for spray characteristics, construction and typical applications.

MODEL NUMBER		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										
ZHNS	ZLHNS		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	125 psi
ZHNS5		.078	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77
ZHNS7		.094	0.49	0.59	0.70	0.86	0.99	1.21	1.40	1.71	1.98	2.2	2.5
ZHNS8		.109	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5	2.8
ZHNS10		.125	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.5
ZHNS11		.141	0.78	0.92	1.1	1.35	1.56	1.91	2.2	2.7	3.1	3.5	3.9
ZHNS11		.125	0.78	0.92	1.1	1.35	1.56	1.91	2.2	2.7	3.1	3.5	3.9
ZHNS13		.141	0.92	1.09	1.3	1.59	1.84	2.3	2.6	3.2	3.7	4.1	4.6
ZHNS16		.156	1.13	1.34	1.6	1.96	2.3	2.8	3.2	3.9	4.5	5.1	5.7
ZHNS20		.172	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.1
ZHNS23		.188	1.63	1.92	2.3	2.8	3.3	4.0	4.6	5.6	6.5	7.3	8.1
ZHNS26		.203	1.84	2.2	2.6	3.2	3.7	4.5	5.2	6.4	7.4	8.2	9.2
ZHNS29		.219	2.1	2.4	2.9	3.6	4.1	5.0	5.8	7.1	8.2	9.2	10.3
ZHNS33		.234	2.3	2.8	3.3	4.0	4.7	5.7	6.6	8.1	9.3	10.4	11.7
	ZLHNS32	.203	2.3	2.7	3.2	3.9	4.5	5.5	6.4	7.8	9.1	10.1	11.3
	ZLHNS40	.234	2.8	3.3	4.0	4.9	5.7	6.9	8.0	9.8	11.3	12.6	14.1
	ZLHNS48	.281	3.4	4.0	4.8	5.9	6.8	8.3	9.6	11.8	13.6	15.2	17.0
	ZLHNS56	.297	4.0	4.7	5.6	6.9	7.9	9.7	11.2	13.7	15.8	17.7	19.8
	ZLHNS64	.328	4.5	5.4	6.4	7.8	9.1	11.1	12.8	15.7	18.1	20	23
	ZLHNS72	.359	5.1	6.0	7.2	8.8	10.2	12.5	14.4	17.6	20	23	25

All references to G.P.M. mean U.S. G.P.M.

ZH SERIES

Hollow cone spray nozzles



DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZH	2.11	1.32
1/4ZH	2.21	1.32
3/8ZH	2.24	1.32
1/2ZH	2.31	1.32

SPRAY CHARACTERISTICS:

A hollow cone spray pattern, emerging at right angles to the centerline of the pipe connection. The standard included angle of the spray cone is 70° at 10 p.s.i. At low pressures hollow cone nozzles produce medium size, uniform droplets. At higher pressures finer droplets are produced.

CONSTRUCTION:

The models listed are machined from bar stock, and are two piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models available in other materials.

TYPICAL APPLICATIONS:

- Air and Gas Washing
- Aerating, Rinsing and Humidifying
- Industrial Washers and Spray Ponds
- Cooling Tunnels
- Roof Cooling
- Degreasing
- Dust Suppression
- Metal Treatment

MODEL NUMBER		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											SPRAY ANGLE @			
ZH	ZLH		3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	10 psi	20 psi	40 psi	80 psi
ZH0.5		.028	--	--	--	--	--	--	0.09	0.10	0.12	0.14	0.16	--	--	40°	45°
ZH1		.060	--	--	--	0.10	0.12	0.14	0.17	0.20	0.24	0.28	0.32	--	61°	74°	69°
ZH2		.085	--	--	--	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	70°	75°	83°	85°
ZH3		.111	--	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	70°	70°	72°	74°
ZH5		.136	--	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	70°	77°	80°	83°
ZH7.5		.166	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	70°	70°	74°	75°
ZH10		.170	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	70°	74°	76°	80°
ZH12.5		.177	0.68	0.88	1.05	1.25	1.53	1.77	2.17	2.5	3.1	3.5	4.0	70°	82°	83°	83°
ZH15		.213	0.82	1.06	1.25	1.50	1.84	2.1	2.60	3.0	3.7	4.2	4.7	70°	73°	75°	75°
ZH20		.250	1.10	1.41	1.67	2.0	2.45	2.8	3.46	4.0	4.9	5.7	6.3	70°	73°	75°	75°
ZH25		.279	1.37	1.77	2.1	2.5	3.06	3.5	4.33	5.0	6.1	7.1	7.9	70°	72°	73°	73°
ZH30		.292	1.64	2.1	2.5	3.0	3.67	4.2	5.20	6.0	7.3	8.5	9.5	70°	70°	73°	72°
	ZLH40	.369	2.2	2.8	3.3	4.0	4.90	5.7	6.93	8.0	9.8	11.3	12.6	70°	75°	75°	75°
	ZLH50	.393	2.7	3.5	4.2	5.0	6.12	7.1	8.66	10.0	12.2	14.1	15.8	70°	70°	71°	73°
	ZLH60	.421	3.3	4.2	5.0	6.0	7.35	8.5	10.39	12.0	14.7	17.0	19.0	70°	70°	71°	71°
	ZLH70	.469	3.8	4.9	5.9	7.0	8.57	9.9	12.12	14.0	17.1	19.8	22.1	70°	74°	76°	76°
	ZLH80	.484	4.4	5.7	6.7	8.0	9.80	11.3	13.86	16.0	19.6	23	25	70°	73°	75°	76°
	ZLH90	.500	4.9	6.4	7.5	9.0	11.02	12.7	15.59	18.0	22	25	28	70°	70°	71°	73°
	ZLH100	.507	5.5	7.1	8.4	10.0	12.25	14.1	17.32	20	24	28	32	70°	73°	76°	78°
	ZLH110	.575	6.0	7.8	9.2	11.0	13.47	15.6	19.05	22	27	31	35	70°	72°	75°	72°
	ZLH120	.568	6.6	8.5	10.0	12.0	14.70	17.0	20.78	24	29	34	38	70°	70°	71°	71°

"--" means not recommended at this pressure.

All references to G.P.M. mean U.S. G.P.M.

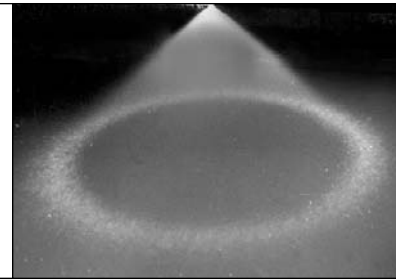
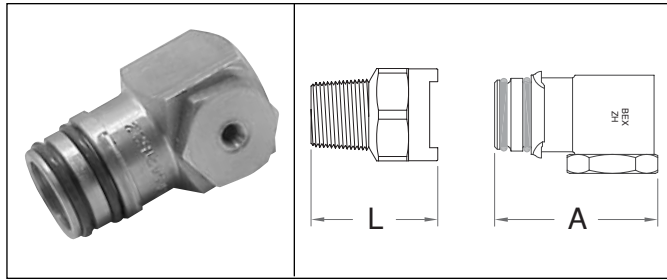
QUICK DISCONNECT

Wide angle hollow cone spray nozzles

ZHW SERIES

DIMENSIONS

MODEL	DIM "L"	DIM "A"
1/8ZHW	2.11	1.32
1/4ZHW	2.21	1.32
3/8ZHW	2.24	1.32
1/2ZHW	2.31	1.32



TYPICAL APPLICATIONS:

- Water Cooling
- Roof Cooling
- Air Cooling
- Air Washing

SPRAY CHARACTERISTICS:

A hollow cone spray pattern, similar to the BEX H series, but with wider spray angles. The included angle of the spray cone is 120° at 10 p.s.i.

CONSTRUCTION:

The models listed are machined from bar stock, and are two piece construction. Standard materials are brass, 303 stainless steel and 316 stainless steel. Some models are also available in other materials.

MODEL NUMBER		MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURE (psi)											SPRAY ANGLE @			
ZHW	ZLHW		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	125 psi	10 psi	20 psi	40 psi	80 psi
ZH1W		.055	--	0.08	0.10	0.12	0.14	0.17	0.20	0.24	0.28	0.32	0.35	120 _i	110 _i	102 _i	90 _i
ZH2W		.077	--	0.17	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	0.71	120 _i	110 _i	105 _i	92 _i
ZH3W		.093	--	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	1.06	120 _i	114 _i	104 _i	90 _i
ZH5W		.109	--	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.77	120 _i	113 _i	107 _i	98 _i
ZH7.5W		.158	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.8	2.1	2.4	2.7	120 _i	115 _i	110 _i	92 _i
ZH10W		.170	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.5	120 _i	115 _i	110 _i	93 _i
ZH12.5W		.188	0.88	1.05	1.25	1.53	1.77	2.2	2.5	3.1	3.5	4.0	4.4	120 _i	118 _i	110 _i	94 _i
ZH15W		.201	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.3	120 _i	115 _i	108 _i	92 _i
ZH20W		.234	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.1	120 _i	118 _i	116 _i	110 _i
ZH25W		.265	1.77	2.1	2.5	3.1	3.5	4.3	5.0	6.1	7.1	7.9	8.8	120 _i	117 _i	115 _i	110 _i
ZH30W		.280	2.1	2.5	3.0	3.7	4.2	5.2	6.0	7.3	8.5	9.5	10.6	120 _i	115 _i	110 _i	102 _i
	ZLH50W	.358	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	17.7	120 _i	115 _i	108 _i	103 _i
	ZLH80W	.468	5.7	6.7	8.0	9.8	11.3	13.9	16.0	20	23	25	28	120 _i	117 _i	110 _i	103 _i

All references to G.P.M. mean U.S. G.P.M.



Hollow cone phosphating nozzles

ZPH SERIES

SPRAY CHARACTERISTICS:

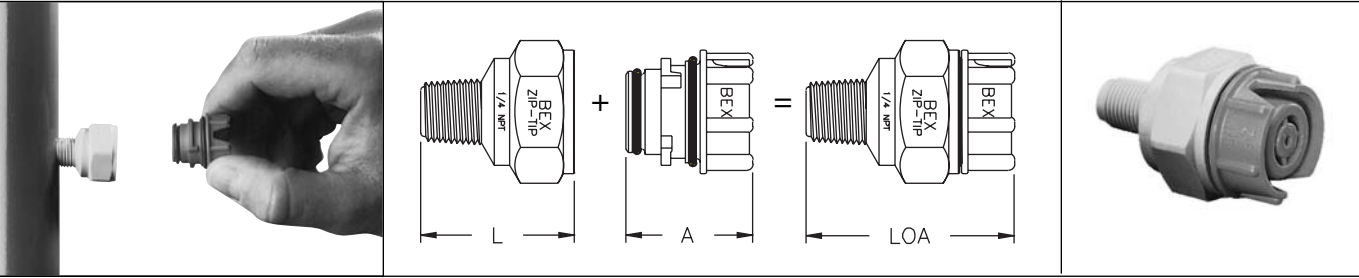
A hollow cone spray pattern for phosphating applications. This large droplet, low impingement type of spray results in a tighter and more consistent phosphate crystalline structure.

CONSTRUCTION:

Two piece construction. Available in 303 stainless steel and 316 stainless steel.

MODEL NUMBER	ORIFICE DIAMETER (inches)		CAPACITY (GPM) AT VARIOUS PRESSURES (psi)											SPRAY ANGLE @		
	BODY	CAP	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	10 psi	15 psi	30 psi	
			psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
ZPH23	.220	.312	1.63	1.92	2.3	2.8	3.3	4.0	4.6	5.6	6.5	7.3	45°	53°	60°	
ZPH28	.231	.312	2.0	2.3	2.8	3.4	4.0	4.8	5.6	6.9	7.9	8.9	40°	43°	48°	
ZPH51	.344	.375	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	40°	50°	50°	
ZPH53	.375	.375	3.5	4.2	5.0	6.1	7.1	8.7	10.0	12.2	14.1	15.8	70°	70°	70°	

All references to G.P.M. mean U.S. G.P.M.



CHARACTERISTICS:

BEX Molded Plastic Zip-Tip® Spray Nozzles are designed to allow fast and easy installation and removal of spray nozzle tips and adapters, while providing positive alignment of spray pattern. Double VITON® O-Ring seals are supplied standard with each nozzle tip. Seals are located on, and removed with, the nozzle tip for easy flushing. A variety of models and spray patterns are available.

CONSTRUCTION:

Molded plastic spray nozzles are available in glass reinforced polypropylene or PVDF (Kynar®). Other materials are available upon request. All models are available in either NPT or BSPT threads. (NOTE: Metal and molded plastic ZIP-TIP® components are not interchangeable.)

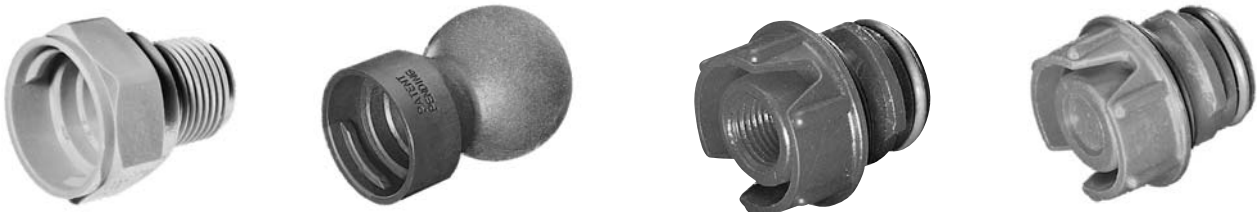
DIMENSIONS

MODEL	DIM "L"	DIM "A"	DIM "LOA"
ZF	1.24	1.00	1.68
ZS	1.24	1.00	1.68
ZSW	1.24	1.00	1.68
ZTA	1.24	1.00	1.68
ZPLUG	1.24	1.00	1.68

TYPICAL APPLICATIONS:

- Spray Washing & Rinsing
- Parts Cleaning
- Pretreatment

ZIP-TIP BODIES AND ADAPTERS



ZBD

1/8" - 1/2" NPT Male Only
Glass reinforced polypropylene or PVDF

KZBD

To be used with K-Ball® Clip-On Nozzle Assemblies.
Glass reinforced polypropylene or PVDF.
(See page 61)

ZTA

1/8" - 3/8" NPT Female Only
Glass reinforced polypropylene or PVDF

ZPLUG

To shut off individual nozzles
Glass reinforced polypropylene or PVDF

HOW TO ORDER BEX ZIP-TIPS

COMPLETE ASEMBLIES:

Indicate ZBD connection size (1/8", 1/4", 3/8" or 1/2") followed by model number (ZF, ZS, ZSW or ZSQ) found on pages 55-57. Then indicate material of construction (Glass reinforced polypropylene, Red PVDF or Natural PVDF).

REPLACEMENT TIPS ONLY

Indicate the tip model number (ZF, ZS, ZSW or ZSQ) found on pages 55-57. Then indicate material of construction (Glass reinforced polypropylene, Red PVDF or Natural PVDF).



Zip-Tip® with Tabz™

Finger Tabz for easier insertion and removal. Available on all models.

QUICK DISCONNECT

Flat “V” spray nozzles

ZF SERIES

SPRAY CHARACTERISTICS:

ZF-Series spray nozzles produce a flat, fan-shaped spray pattern with spray angles available from 15° to 110° measured at 40 psi. Spray angles generally increase with pressure, as shown in the capacity table.

Spray density tapers off toward the outside of these sprays, to permit overlapping of spray patterns while maintaining uniform spray density.

CONSTRUCTION:

Molded plastic spray nozzles are available in glass reinforced polypropylene or PVDF (Kynar®).



COLOR CODING:

Zip-Tip flat “V” spray tips are color-coded for easy identification.

TYPICAL APPLICATIONS:

- Parts Cleaning
- Metal Washing
- Foam Control
- Asphalt Spraying
- Gravel Washing
- Vehicle Washing
- Fertilizer Spraying
- Dishwashers

Additional sizes may be available upon request. Please contact your BEX distributor.

See chart on page 54 for dimensions.

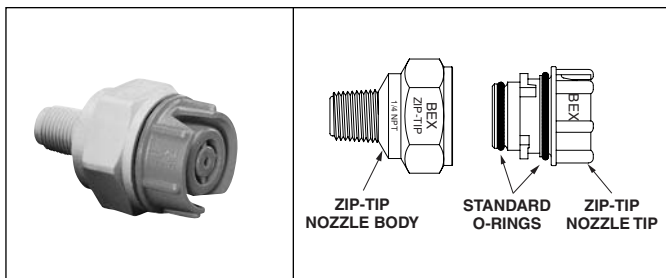
	ZF MODEL	TIP COLOR	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)															SPRAY ANGLE @		
			5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	150 psi	300 psi	20 psi	40 psi	80 psi		
110°	ZF11003	Lime Green	.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	92°	110°	118°	
	ZF11004	Lime Green	.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	90°	110°	112°	
	ZF11005	Lime Green	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	96°	110°	114°	
	ZF11006	Lime Green	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	97°	110°	115°	
	ZF11008	Lime Green	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.19	100°	110°	115°	
	ZF11010	White	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.74	102°	110°	115°	
	ZF11015	Grey	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.68	1.84	2.12	2.37	2.90	4.1	102°	110°	115°	
	ZF11020	Lt. Blue	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.00	2.24	2.45	2.83	3.2	3.9	5.5	103°	110°	112°	
	ZF11030	Purple	.129	1.06	1.25	1.50	1.84	2.12	2.60	3.00	3.4	3.7	4.2	4.7	5.8	8.2	103°	110°	112°	
	ZF11040	Green	.149	1.41	1.67	2.00	2.45	2.83	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	103°	110°	112°	
	ZF11050	Yellow	.167	1.77	2.09	2.50	3.06	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	107°	110°	116°	
	ZF11060	Blue	.182	2.12	2.51	3.00	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	104°	110°	112°	
ZF11070	Red	.197	2.47	2.93	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	107°	110°	112°		
95°	ZF9503	Lime Green	.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	86°	95°	101°	
	ZF9504	Lime Green	.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	86°	95°	101°	
	ZF9505	Lime Green	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	86°	95°	101°	
	ZF9506	Lime Green	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	86°	95°	101°	
	ZF9508	Lime Green	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	86°	95°	100°	
	ZF9510	White	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	88°	95°	99°	
	ZF9515	Grey	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.5	1.68	1.84	2.1	2.4	2.9	4.1	90°	95°	100°	
	ZF9520	Lt. Blue	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	89°	95°	99°	
	ZF9530	Purple	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	90°	95°	101°	
	ZF9540	Green	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	90°	95°	100°	
	ZF9550	Yellow	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	91°	95°	101°	
	ZF9560	Blue	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	92°	95°	102°	
ZF9570	Red	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	92°	95°	103°		
80°	ZF8002	Lime Green	.034	0.07	0.08	0.10	0.12	0.14	0.17	0.20	0.22	0.24	0.28	0.32	0.39	0.55	74°	80°	83°	
	ZF8003	Lime Green	.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	74°	80°	83°	
	ZF8004	Lime Green	.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	74°	80°	83°	
	ZF8005	Lime Green	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	74°	80°	83°	
	ZF8006	Lime Green	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	74°	80°	83°	
	ZF8008	Lime Green	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	75°	80°	83°	
	ZF8010	White	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	75°	80°	83°	
	ZF8015	Grey	.091	0.53	0.63	0.75	0.92	1.06	1.30	1.5	1.68	1.84	2.1	2.4	2.9	4.1	74°	80°	86°	
	ZF8020	Lt. Blue	.105	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.2	2.4	2.8	3.2	3.9	5.5	74°	80°	85°	
	ZF8030	Purple	.129	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.4	3.7	4.2	4.7	5.8	8.2	75°	80°	86°	
	ZF8040	Green	.149	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.5	4.9	5.7	6.3	7.7	11.0	76°	80°	85°	
	ZF8050	Yellow	.167	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	9.7	13.7	77°	80°	84°	
ZF8060	Blue	.182	2.1	2.5	3.0	3.7	4.2	5.2	6.0	6.7	7.3	8.5	9.5	11.6	16.4	77°	80°	84°		
ZF8070	Red	.197	2.5	2.9	3.5	4.3	4.9	6.1	7.0	7.8	8.6	9.9	11.1	13.6	19.2	78°	80°	87°		
65°	ZF6502	Lime Green	.034	0.07	0.08	0.10	0.12	0.14	0.17	0.20	0.22	0.24	0.28	0.32	0.39	0.55	53°	65°	72°	
	ZF6503	Lime Green	.041	0.11	0.13	0.15	0.18	0.21	0.26	0.30	0.34	0.37	0.42	0.47	0.58	0.82	53°	65°	72°	
	ZF6504	Lime Green	.047	0.14	0.17	0.20	0.24	0.28	0.35	0.40	0.45	0.49	0.57	0.63	0.77	1.10	54°	65°	72°	
	ZF6505	Lime Green	.053	0.18	0.21	0.25	0.31	0.35	0.43	0.50	0.56	0.61	0.71	0.79	0.97	1.37	54°	65°	72°	
	ZF6506	Lime Green	.058	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.67	0.73	0.85	0.95	1.16	1.64	54°	65°	72°	
	ZF6508	Lime Green	.067	0.28	0.33	0.40	0.49	0.57	0.69	0.80	0.89	0.98	1.13	1.26	1.55	2.2	55°	65°	71°	
	ZF6510	White	.075	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.12	1.22	1.41	1.58	1.94	2.7	57°	65°	73°	
	ZF6512	Orange	.082	0.42	0.50	0.60	0.73	0.85	1.04	1.20	1.34	1.47	1.70	1.90	2.3	3.3	59°	65°	71°	

All references to G.P.M. mean U.S. G.P.M.

QUICK DISCONNECT

Full cone spray nozzles

ZS SERIES



FULL-CONE SPRAY



ZS

Spray Angles: Wide range
 Capacities: Up to 2.2 G.P.M. @ 10 psi
 Materials: Glass-filled Poly or PVDF

Features: A full-cone spray with uniform spray distribution. Removable patented vane is standard.

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													Spray Angle @		
		3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi	
ZS1	.033	--	--	--	--	0.12	0.14	0.17	0.20	0.24	0.28	0.32	0.39	110°	105°	96°	
ZS1.5	.046	--	--	--	0.15	0.18	0.21	0.26	0.30	0.37	0.42	0.47	0.58	117°	108°	100°	
ZS2	.051	--	--	0.17	0.20	0.24	0.28	0.35	0.40	0.49	0.57	0.63	.077	117°	110°	100°	
ZS3	.051	--	0.21	0.25	0.30	0.37	0.42	0.52	0.60	0.73	0.85	0.95	1.16	118°	110°	103°	
ZS3.5	.051	0.19	0.25	0.29	0.35	0.43	0.49	0.61	0.70	0.86	0.99	1.11	1.36	118°	108°	102°	
ZS5	.064	0.27	0.35	0.42	0.50	0.61	0.71	0.87	1.00	1.22	1.41	1.58	1.94	120°	112°	102°	
ZS6	.064	0.33	0.42	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	118°	114°	104°	
ZS6.5	.091	0.36	0.46	0.54	0.65	0.80	0.92	1.13	1.30	1.59	1.84	2.1	2.5	118°	117°	102°	
ZS7.5	.091	0.41	0.53	0.63	0.75	0.92	1.06	1.30	1.50	1.84	2.1	2.4	2.9	120°	120°	106°	
ZS8.5	.091	0.47	0.60	0.71	0.85	1.04	1.20	1.47	1.70	2.1	2.4	2.7	3.3	122°	118°	106°	
ZS10	.091	0.55	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	122°	118°	106°	
ZS14	.091	0.77	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	122°	118°	106°	
ZS15	.102	0.82	1.06	1.25	1.50	1.84	2.1	2.6	3.0	3.7	4.2	4.7	5.8	122°	118°	106°	
ZS18	.102	0.99	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	5.1	5.7	7.0	122°	118°	106°	
ZS20	.102	1.10	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	122°	118°	106°	
ZS22	.114	1.20	1.56	1.84	2.2	2.7	3.1	3.8	4.4	5.4	6.2	7.0	8.5	122°	118°	106°	

See chart on page 54 for dimensions.

WIDE ANGLE FULL-CONE



ZSW

Spray Angles: Up to 125° @ 10 psi
 Capacities: Up to 2.4 G.P.M. @ 10 psi
 Materials: Glass-filled Poly or PVDF

Features: A wide full-cone spray with uniform spray distribution. Removable patented vane is standard.

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													Spray Angle @		
		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi		
ZS2.8W	.051	--	0.23	0.28	0.34	0.40	0.48	0.56	0.69	0.79	0.89	1.08	1.10°	105°	96°		
ZS4.3W	.051	--	0.36	0.43	0.53	0.61	0.74	0.86	1.05	1.22	1.36	1.67	117°	108°	100°		
ZS5.6W	.064	--	0.47	0.56	0.69	0.79	0.97	1.12	1.37	1.58	1.77	2.2	117°	110°	100°		
ZS8W	.081	0.57	0.67	0.80	0.98	1.13	1.39	1.60	1.96	2.3	2.5	3.1	118°	110°	103°		
ZS10W	.091	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	118°	108°	102°		
ZS12W	.091	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	3.4	3.8	4.6	120°	112°	102°		
ZS14W	.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	118°	114°	104°		
ZS17W	.102	1.20	1.42	1.70	2.1	2.4	2.9	3.4	4.2	4.8	5.4	6.6	118°	117°	102°		
ZS20W	.102	1.41	1.67	2.0	2.4	2.8	3.5	4.0	4.9	5.7	6.3	7.7	120°	120°	106°		
ZS24W	.102	1.70	2.0	2.4	2.9	3.4	4.2	4.8	5.9	6.8	7.6	9.3	122°	118°	106°		

See chart on page 54 for dimensions.

FULL-SQUARE SPRAY



ZSQ

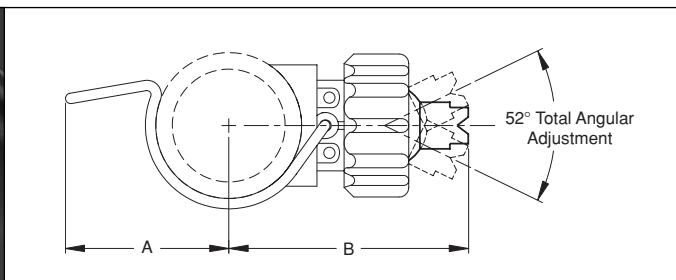
Spray Angles: Wide range
 Capacities: Up to 1.8 G.P.M. @ 10 psi
 Materials: Glass-filled Poly or PVDF

Features: A full-square spray with uniform spray distribution. Removable patented vane is standard.

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													Spray Angle @		
		5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	150 psi	7 psi	20 psi	80 psi		
ZS3.6SQ	.057	--	0.30	0.36	0.44	0.51	0.62	0.72	0.88	1.02	1.14	1.39	42°	55°	50°		
ZS4.8SQ	.064	--	0.40	0.48	0.59	0.68	0.83	0.96	1.18	1.36	1.52	1.86	50°	65°	60°		
ZS6SQ	.081	--	0.50	0.60	0.73	0.85	1.04	1.20	1.47	1.70	1.90	2.3	30°	65°	60°		
ZS10SQ	.091	0.71	0.84	1.00	1.22	1.41	1.73	2.0	2.4	2.8	3.2	3.9	61°	67°	60°		
ZS12SQ	.091	0.85	1.00	1.20	1.47	1.70	2.1	2.4	2.9	3.4	3.8	4.6	71°	76°	69°		
ZS14SQ	.091	0.99	1.17	1.40	1.71	1.98	2.4	2.8	3.4	4.0	4.4	5.4	78°	85°	75°		
ZS18SQ	.091	1.27	1.51	1.80	2.2	2.5	3.1	3.6	4.4	5.1	5.7	7.0	85°	88°	76°		

See chart on page 54 for dimensions.

All references to G.P.M. mean U.S. G.P.M.



DIMENSIONS

PIPE SIZE	Dim. A	Dim. B
1"	1 ³ / ₄ (45 mm)	2 ⁷ / ₈ (73 mm)
1 ¹ / ₄ "	2 (51 mm)	3 (77 mm)
1 ¹ / ₂ "	2 ¹ / ₈ (54 mm)	3 ¹ / ₈ (80 mm)
2"	2 ³ / ₈ (61 mm)	3 ¹ / ₂ (89 mm)

SPRAY CHARACTERISTICS:

These nozzles simply clip over a pre-drilled pipe (9/16" dia. hole) and are available with a variety of spray balls, in various spray patterns, flow rates and spray angles.

CONSTRUCTION:

Made of corrosion-resistant plastic and stainless steel. Heavy-duty spring clip good to 100 p.s.i. at 175° F. A 316SS clip is also available, if required.

TYPICAL APPLICATIONS:

- Parts Cleaning
- Pretreatment
- Spray Washing & Rinsing

Double clip model also available.

THE BEX "FINGER" SYSTEM

The BEX spring clamp is the heaviest and most durable used in the industry. It provides long service at pressures up to 100 psi. Also available with a second clip.

Standard O-Ring seal is EPDM. Buna-N, Viton®, and special "retrofit" seals are available.

Square fitting glass filled polypropylene bodies are available in four pipe sizes and are good up to 175°F.

Hundreds of standard nozzle balls and spray options are available when using our threaded ball, below, or the Zip-Tip® nozzle adapter (see page 54).

The K-Ball® cap has strong buttress threads and is made from glass filled polypropylene or PVDF.

BEX unique "Finger" system holds the ball securely in alignment to prevent movement when the cap is tightened. The "Finger" system is optional on all BEX B-Ball® adjustable nozzles.

HOW TO ORDER COMPLETE K-BALL ASSEMBLIES

Use the correct body part number (from the parts listed in BOLD at the right), followed by the model number for the nozzle ball (see pages 59 and 60).

Example:

BF5070 nozzle balls are needed to fit onto a 1-1/4" pipe. Accurate alignment of the nozzles is critical, so the 1-1/4" body with "fingers" will be used. The correct PART number for this K-Ball nozzle assembly is 1.2KFBF5070.

K-BALL BODY COLORS AND PART NUMBERS

Pipe Sizes	1"	1-1/4"	1-1/2"	2"
Standard Body	1K (white)	1.2K (grey)	1.5K (black)	2K (tan)
Body with Fingers	1KF (green)	1.2KF (yellow)	1.5KF (red)	2KF (blue)
Spring Clip	1KCL	1.2KCL	1.5KCL	2KCL
O-ring	KOR	KOR	KOR	KOR
K-Ball Cap	KCAP	KCAP	KCAP	KCAP

SPRAY BALL: CHOOSE FROM THE TABLES ON PAGES 59 AND 60.

QUICK DISCONNECT

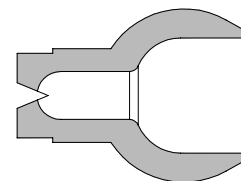
BF FLAT-V SPRAY NOZZLE BALLS (for 1", 1-1/4", 1-1/2" and 2" pipe)

SPRAY CHARACTERISTICS:

Spray is fan-shaped with spray angles of 15° to 110°. Spray density tapers off toward the outside to permit overlapping of the spray patterns while maintaining uniform spray density.

COLOR CODING:

The more popular models of the flat-V spray nozzle balls are color coded by flowrate for easier identification.

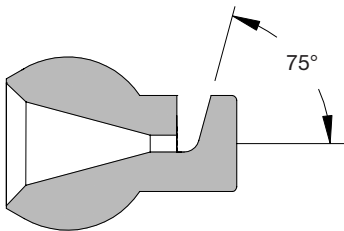


SPRAY ANGLE @ 40psi	MODEL NUMBER	SPRAY BALL COLOUR	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @	
				5 psi	7 psi	10 psi	15 psi	20 psi	25 psi	30 psi	40 psi	50 psi	20 psi	40 psi	
110°	BF11060	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	107°	110°	
95°	BF9530	Purple	0.129	1.06	1.25	1.50	1.84	2.1	2.4	2.6	3.0	3.4	63°	95°	
	BF9540	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	63°	95°	
	BF9550	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	63°	95°	
	BF9560	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	63°	95°	
80°	BF8010	White	0.238	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	75°	80°	
	BF8020	Light Blue	0.105	0.71	0.84	1.00	1.22	1.41	1.58	1.73	2.0	2.2	63°	80°	
	BF8030	Purple	0.129	1.06	1.25	1.50	1.84	2.1	2.4	2.6	3.0	3.4	63°	80°	
	BF8040	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	76°	80°	
	BF8050	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	77°	80°	
	BF8060	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	77°	80°	
	BF8070	Red	0.197	2.5	2.9	3.5	4.3	4.9	5.5	6.1	7.0	7.8	78°	80°	
	BF80100	Brown	0.238	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	75°	80°	
65°	BF6520	Light Blue	0.105	0.71	0.84	1.00	1.22	1.41	1.58	1.73	2.0	2.2	63°	65°	
	BF6530	Purple	0.129	1.06	1.25	1.50	1.84	2.1	2.4	2.6	3.0	3.4	63°	65°	
	BF6540	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	63°	65°	
	BF6550	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	63°	65°	
	BF6560	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	63°	65°	
	BF6570	Red	0.197	2.5	2.9	3.5	4.3	4.9	5.5	6.1	7.0	7.8	63°	65°	
	BF65100	Brown	0.238	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	58°	65°	
50°	BF5020	Light Blue	0.105	0.71	0.84	1.00	1.22	1.41	1.58	1.73	2.0	2.2	63°	50°	
	BF5030	Purple	0.129	1.06	1.25	1.50	1.84	2.1	2.4	2.6	3.0	3.4	63°	50°	
	BF5040	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	43°	50°	
	BF5050	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	43°	50°	
	BF5060	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	43°	50°	
	BF5070	Red	0.197	2.5	2.9	3.5	4.3	4.9	5.5	6.1	7.0	7.8	43°	50°	
	BF50100	Brown	0.238	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	44°	50°	
40°	BF4040	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	33°	40°	
	BF4050	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	35°	40°	
	BF4060	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	37°	40°	
	BF4070	Red	0.197	2.5	2.9	3.5	4.3	4.9	5.5	6.1	7.0	7.8	35°	40°	
	BF40100	Brown	0.238	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	33°	40°	
25°	BF2540	Green	0.149	1.41	1.67	2.0	2.4	2.8	3.2	3.5	4.0	4.5	22°	25°	
	BF2550	Yellow	0.167	1.77	2.1	2.5	3.1	3.5	4.0	4.3	5.0	5.6	20°	25°	
	BF2560	Blue	0.183	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	18°	25°	
	BF2570	Red	0.197	2.5	2.9	3.5	4.3	4.9	5.5	6.1	7.0	7.8	19°	25°	
	BF25100	Brown	0.236	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	21°	25°	
15°	BF15100	Brown	0.236	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	11.2	13°	15°	
	BF15120	Black	0.258	4.2	5.0	9.0	7.3	8.5	9.4	10.4	12.0	13.4	12°	15°	
	BF15150	Black	0.289	5.3	6.3	7.5	9.2	10.6	11.9	13.0	15.0	16.8	12°	15°	

All references to G.P.M. mean U.S. G.P.M.

**BFL FLOODING
SPRAY NOZZLE
BALLS**

(for 1", 1-1/4", 1-1/2" and 2" pipe)



SPRAY CHARACTERISTICS:

A wide, flat shaped spray with low impact. The spray is deflected 75° from the centerline of the nozzle, as shown.

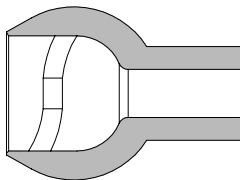
TYPICAL APPLICATIONS:

Flooding nozzles are often used at the beginning and end of phosphate stages, to prevent mist carry over. They can also be used for "wetting" surfaces during long drain stages.

MODEL NUMBER	EQUIV. ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @	
		3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	25 psi	30 psi	40 psi	50 psi	7 psi	20 psi
BFL5	0.183	0.27	0.35	0.42	0.50	0.61	0.71	0.79	0.87	1.00	1.12	114°	130°
BFL10	0.075	0.55	0.71	0.84	1.00	1.22	1.41	1.58	1.73	2.0	2.2	134°	146°
BFL18	0.149	0.99	1.27	1.51	1.80	2.2	2.5	2.8	3.1	3.6	4.0	130°	142°
BFL24	0.167	1.31	1.70	2.0	2.4	2.9	3.4	3.8	4.2	4.8	5.4	121°	136°
BFL30	0.183	1.64	2.1	2.5	3.0	3.7	4.2	4.7	5.2	6.0	6.7	120°	133°
BFL40	0.218	2.2	2.8	3.3	4.0	4.9	5.7	6.3	6.9	8.0	8.9	130°	144°

**BPH HOLLOW CONE
PHOSPHATING
NOZZLE BALLS**

(for 1", 1-1/4", 1-1/2" and 2" pipe)



SPRAY CHARACTERISTICS:

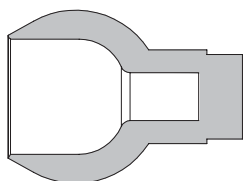
A hollow cone pattern with low impact. BPH nozzle balls are made of glass reinforced polypropylene. Available in three models.

TYPICAL APPLICATIONS:

Designed specifically for phosphate stages. This large droplet, low impact spray results in tighter and more consistent phosphate crystalline structure. It minimizes the misting of phosphate spray, thus reducing 'pre-coating', streaking, and carry over to adjacent stages.

MODEL NUMBER	SPRAY BALL COLOR	MAXIMUM FREE PASSAGE (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)										SPRAY ANGLE @			
			3 psi	5 psi	7 psi	10 psi	15 psi	20 psi	25 psi	30 psi	40 psi	5 psi	7 psi	10 psi	20 psi	
BPH28	White	0.250	1.53	1.98	2.3	2.8	3.4	4.0	4.4	4.8	5.60	44°	52°	53°	55°	
BPH51	Grey	0.312	2.7	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	37°	40°	42°	48°	
BPH53	Black	0.312	2.7	3.5	4.2	5.0	6.1	7.1	7.9	8.7	10.0	62°	70°	71°	73°	

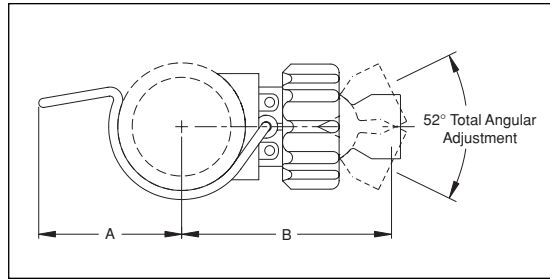
**KPLUG SHUT-OFF
PLUG**



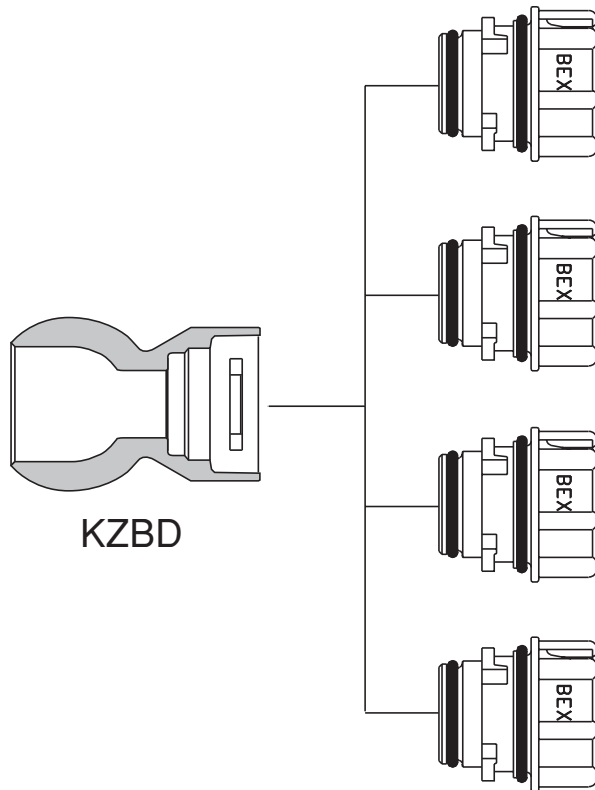
TYPICAL APPLICATIONS:

The KPLUG nozzle ball is used in place of any other nozzle ball to completely shut off the flow to the nozzle.

QUICK DISCONNECT



KZBD ADAPTER BALLS



**ZF
FLAT "V" SPRAY**

F-Series spray nozzle that produces a flat, fan-shaped spray pattern. See page 55.

**ZS
FULL-CONE SPRAY**

A full-cone tip with uniform spray distribution. See page 57.

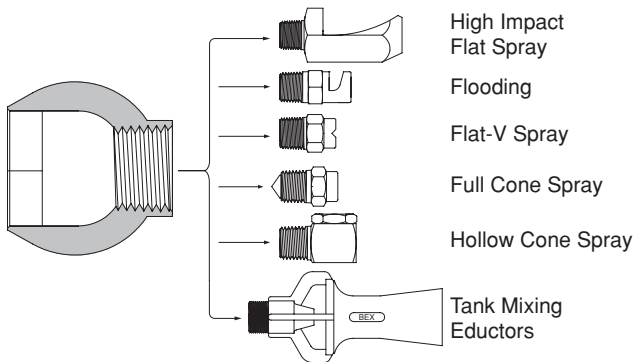
**ZSW
WIDE ANGLE FULL-CONE
SPRAY**

Wide, full-cone spray with uniform spray distribution. See page 57.

**ZSQ
FULL-SQUARE SPRAY**

A full-square spray with uniform spray distribution. See page 57.

THREADED BALLS (for K-Ball nozzle assemblies)



Ball has a hexagonal interior for easy holding

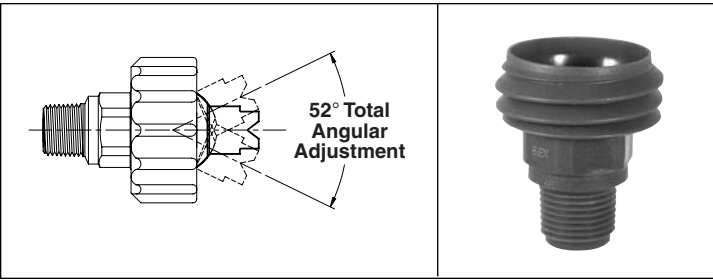
TYPICAL APPLICATIONS:

Expand your range of nozzle choices by using threaded balls. Threaded balls are made of glass reinforced polypropylene, with 1/8", 1/4" and 3/8" NPT female threads. (BSPT also available)

MODEL	DESCRIPTION
1B	1/8" NPT Female thread
2B	1/4" NPT Female thread
3B	3/8" NPT Female thread
5B	1/2" NPT Female thread

Please note: The 5B has an angular adjustment of only 34°.

QUICK DISCONNECT



The BEX threaded K-Ball® body provides the ability to adjust the direction of the spray pattern by simply twisting the K-Ball® cap, repositioning the nozzle and tightening the cap. The same 52° nozzle angle of adjustability exists in the threaded body as in the K-Ball® clip-on

body. This plastic threaded body is useful when a metal clip is undesirable or where space limitations prevent using a spring clip-on nozzle.

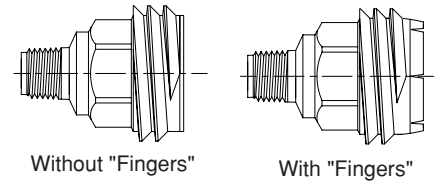
ORDERING ASSEMBLIES:

You can easily order complete threaded K-Ball® ball assemblies using the ball model numbers listed on page 59. Example 3/8KFBF5070

MODELS AVAILABLE:

MALE NPT THREAD	MODEL NUMBER	
	Without "Fingers"	With "Fingers"
1/4	1/4KBD	1/4KFBD
3/8	3/8KBD	3/8KFBD
1/2	1/2KBD	1/2KFBD

*BSPT also available



QUICK DISCONNECT

CLIP-ON NOZZLE THREADED ADAPTER (for 1", 1 1/4", 1 1/2" and 2" pipe)

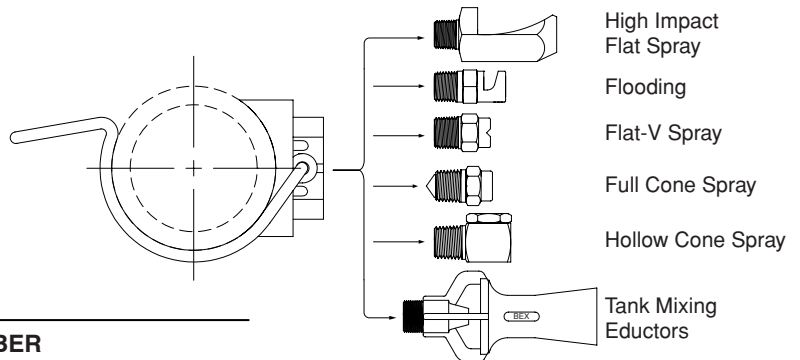
FEATURES:

This adapter allows for quick mounting and removal of threaded nozzles.

APPLICATIONS:

Useful to mount nozzles in a fixed position, where adjustability is not desired.

(Drill a 9/16" diameter hole)



ADAPTER THREAD	MODEL NUMBER			
	1" Pipe	1 1/4" Pipe	1 1/2" Pipe	2" Pipe
1/8 NPT Female	1K.1	1.2K.1	1.5K.1	2K.1
1/4 NPT Female	1K.2	1.2K.2	1.5K.2	2K.2
3/8 NPT Female	1K.3	1.2K.3	1.5K.3	2K.3

Double clip model also available.

All references to G.P.M. mean U.S. G.P.M.

OTHER NOZZLES AND ACCESSORIES



EDUCTORS



EDUCTOR PRINCIPLES:

BEX eductors use a unique venturi design which enables smaller pumps to circulate large volumes of tank solution. The eductor will circulate four to five gallons of solution for each gallon pumped.

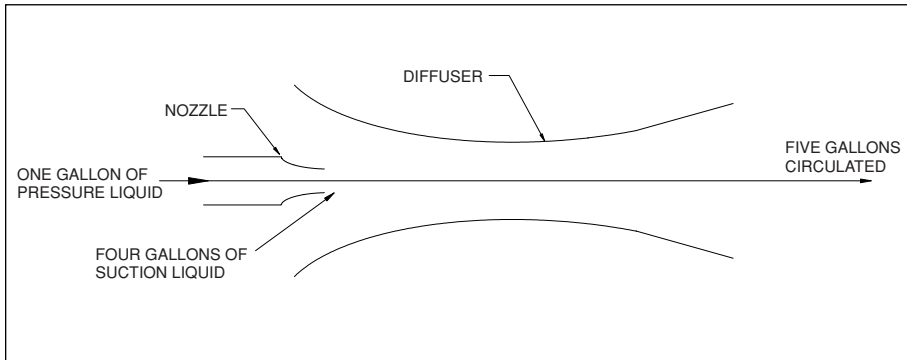
BEX eductors are used for mixing chemicals, suspending solids, adjusting pH, "sweeping" debris or sludge toward a filter intake and many other useful applications.

CONSTRUCTION:

Standard materials are cast iron, 316 SS, PVDF (Kynar®) and glass-filled polypropylene. Other materials are available upon request.

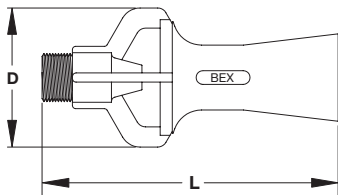
TYPICAL APPLICATIONS:

- Plating Tanks
- Cleaning Tanks
- Phosphating Tanks
- E-coat Tanks
- Fertilizer Tanks
- Pulp Tanks
- Sludge Tanks
- Paint Booths
- Anodizing Tanks
- Cooling Towers
- Decorative Fountains



Sizes from 1/4" to 3" N.P.T. (BSPT models also available)

MOLDED PLASTIC MODELS



DIMENSIONS

MODEL NUMBER	Pipe Size	Dim. L	Dim. D
T00MP	1/4 NPT Male	3 1/8	1 1/2
T0MP	3/8 NPT Male	4 1/2	2 1/8
T2MP	3/4 NPT Male	6 3/8	3
T3MP	1 NPT Male	8 1/2	3 3/4
T4MP	1 1/2 NPT Male	9 7/8	4 5/8

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	NOZZLE FLOW (GPM) AT VARIOUS PRESSURES (psi)							
		10 psi	15 psi	20 psi	25 psi	30 psi	35 psi	40 psi	50 psi
T00MP	0.188	3.2	3.9	4.5	5.0	5.5	5.9	6.3	7.1
T0MP	0.288	7.5	9.2	10.6	11.9	13.0	14.0	15.0	16.8
T2MP	0.386	13.5	16.5	19.1	21	23	25	27	30
T3MP	0.481	21	26	30	33	36	39	42	47
T4MP	0.612	33	40	47	52	57	62	66	74

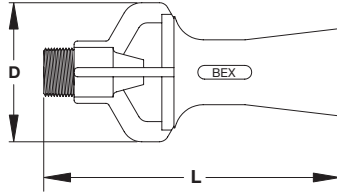
All references to G.P.M. mean U.S. G.P.M.

EDUCTOR CIRCULATION RATIO OF SUPPLY TO DISCHARGE IS 1:5

The capacity table provides the flow of water through the nozzle orifice. To determine circulation, multiply this value by five (5).

AVAILABLE IN GLASS REINFORCED POLYPROPYLENE AND PVDF (KYNAR®)

BEX 316SS INVESTMENT CAST TANK MIXING EDUCTORS



CONSTRUCTION:

These precision investment cast models are available in 316 stainless steel.

The capacity table provides the flow of water through the nozzle orifice. To determine discharge, multiply this value by five (5).

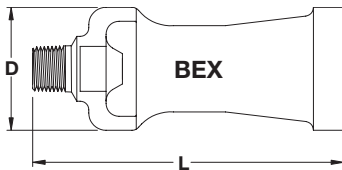
DIMENSIONS

MODEL NUMBER	Pipe Size	Dim. L	Dim. D
T0M	3/8" NPT Male	4 1/2"	2 1/8"
T2M	3/4" NPT Male	6 3/8"	3"
T3M	1" NPT Male	8 1/2"	3 3/4"
T4M	1 1/2" NPT Male	9 7/8"	4 5/8"

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	NOZZLE FLOW (GPM) AT VARIOUS PRESSURES (psi)							
		10 psi	15 psi	20 psi	25 psi	30 psi	35 psi	40 psi	50 psi
T0M	0.288	7.5	9.2	10.6	11.9	13.0	14.0	15.0	16.8
T2M	0.386	13.5	16.5	19.1	21	23	25	27	30
T3M	0.481	21	26	30	33	36	39	42	47
T4M	0.612	33	40	47	52	57	62	66	74

BEX CAST IRON & SPECIAL "SAND CAST" ALLOYS

Includes 2" & 3" 316SS models



Sand cast models include cast iron, alloy 20 and larger (2" and 3") 316SS models. Special alloys may be available upon request.

The capacity table provides the flow of water through the nozzle orifice. To determine discharge, multiply this value by four (4).

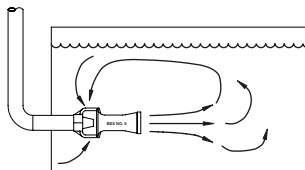
DIMENSIONS

MODEL NUMBER	Pipe Size	Dim. L	Dim. D
T0M	3/8" NPT Male	4 1/2"	1 3/4"
T2M	3/4" NPT Male	6 3/4"	2 3/8"
T22M	3/4" NPT Male	6 3/4"	2 3/8"
T3M	1" NPT Male	7 5/8"	2 7/8"
T4	1 1/2" NPT Female	9 1/2"	3 3/4"
T5	2" NPT Female	12 1/4"	4 1/8"
T6	3" NPT Female	17 1/8"	7 1/2"

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	NOZZLE FLOW (GPM) AT VARIOUS PRESSURES (psi)							
		10 psi	15 psi	20 psi	25 psi	30 psi	35 psi	40 psi	50 psi
T0M	0.288	7.5	9.2	10.6	11.9	13.0	14.0	15.0	16.8
T2M	0.386	13.5	16.5	19.1	21	23	25	27	30
T22M	0.422	13.5	16.5	19.1	21	23	25	27	30
T3M	0.481	21	26	30	33	36	39	42	47
T4M	0.612	33	40	47	52	57	62	66	74
T4	0.612	33	40	47	52	57	62	66	74
T5	0.781	55	67	78	87	95	103	110	123
T6	1.188	126	154	178	199	218	236	252	282

USING BEX EDUCTORS AS STEAM SPARGERS

(for 1", 1 1/4", 1 1/2" and 2" pipe)



APPLICATIONS:

BEX Steam Spargers heat water and other liquids quickly and efficiently by direct injection of steam. They are designed for tank immersion and eliminate water hammer noise.

SELECTING THE RIGHT EDUCTOR:

(1) Calculate the required steam flow rate from the following equation:

$$\text{Steam Required (lbs./hr)} = \frac{\text{Temp. increase of water (}^\circ\text{F)} \times \text{weight of water (lbs.)}}{\text{Time allowed to heat tank (hrs.)} \times 1000}$$

(2) Knowing the steam flow rate and the steam pressure available at the sparger, choose the sparger(s) from the table below. Using several small spargers may be advisable to using one large sparger.

(3) To help eliminate steam hammer, ensure that the minimum absolute pressure of the eductor is at least twice the absolute pressure inside the tank, at eductor depth.

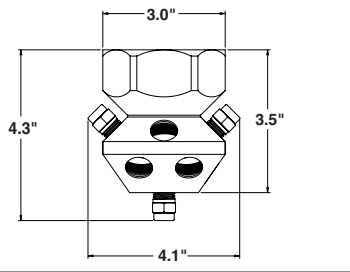
Note:

- 1 Imperial gallon of water = 10.00 lbs.
- 1 cubic foot of water = 62.40 lbs.
- 1 U.S. gallon of water = 8.33 lbs.
- 1 litre of water = 2.20 lbs.

MODEL NUMBER	MAXIMUM FREE PASSAGE (inches)	STEAM CAPACITIES (lbs/hr) AT VARIOUS STEAM PRESSURES (psi)							
		20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	120 psi	150 psi
T0M	0.288	136	175	214	293	371	450	528	646
T2M	0.386	212	273	334	456	579	701	823	1006
T3M	0.481	352	453	555	758	961	1164	1366	1671
T4	0.612	590	760	930	1270	1610	1950	2290	2800
T5	0.781	896	1154	1412	1929	2445	2962	3478	4253
T6	1.188	1975	2544	3113	4252	5390	6528	7667	9374

TWA SERIES

Tank washing assembly



TYPICAL APPLICATIONS:

This assembly is suitable for a variety of tank washing applications where the maximum tank diameter is no greater than approximately 10 feet. The assembly will pass through a tank opening of at least 4.1" in diameter.

SPRAY CHARACTERISTICS:

This unit provides a fixed, non-rotating spray pattern. The assembly body has 13 individual female NPT nozzle connections which are designed to accept full cone nozzles. For best results, select 'S' series full cone spray nozzles from page 21. A wide variety of flow rates are available. A few standard combinations are listed in the table below.

CONSTRUCTION:

The assembly is available in brass, 303 and 316 stainless steel. A 1 1/2" female NPT connection attaches to the supply line. Maximum recommended operating pressure is 60 psi.

FULL-CONE SPRAY NOZZLES		CAPACITIES (GPM) AT VARIOUS PRESSURES (psi)						
ONE PIECE BODY REMOVABLE INSERT	TWO PIECE BODY REMOVABLE INSERT	10 psi	20 psi	30 psi	40 psi	60 psi	80 psi	100 psi
1 1/2 TWA 1/4 S5	1 1/2 TWA 1/4 GS5	6.5	9.2	11.3	13.0	15.9	18.4	21
1 1/2 TWA 1/4 S10	1 1/2 TWA 1/4 GS10	13.0	18.4	23	26	32	37	41
1 1/2 TWA 3/8 S15	1 1/2 TWA 3/8 GS15	20	28	35	40	49	57	63
1 1/2 TWA 3/8 S22	1 1/2 TWA 3/8 GS22	29	41	50	58	71	82	92

All references to G.P.M. mean U.S. G.P.M.

M7S SERIES

Cluster nozzle assembly

PRODUCT DESCRIPTION:

The M7S series cluster nozzle uses an array of seven (7) GS style full-cone spray nozzle caps mounted on a cluster nozzle body to produce a full-cone spray. Multiple full-cone spray nozzle caps produce a relatively small droplet size for large flow rates and are less susceptible to clogging. Nozzle caps are easily removed for cleaning or nozzle change-out.

CONSTRUCTION:

Standard cluster nozzle body and cap materials are brass, 303 stainless steel and 316 stainless steel. Other body and cap materials are available upon request.

U.S. Patent No. 4,142,682

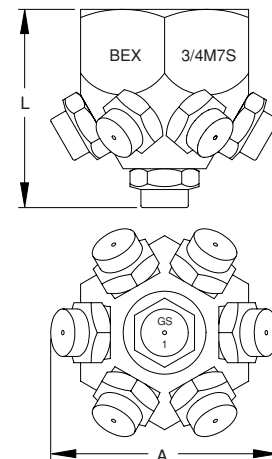
Canadian Patent No. 1,050,589

TYPICAL APPLICATIONS:

- Chemical Processing
- Cooling Sprays
- Stack Gas Scrubbers

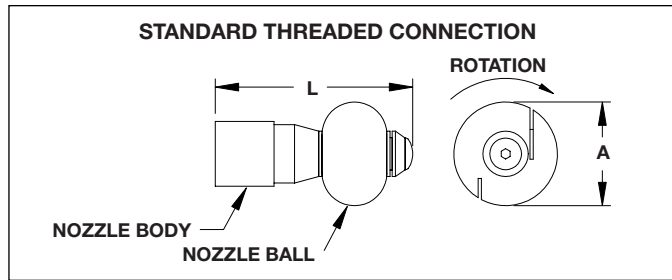
DIMENSIONS

NOZZLE TYPE	Dim. A	Dim. L
3/4 M7S	2.4	2.1
1 M7S	2.9	2.5
1 1/2 M7S	4.1	3.4

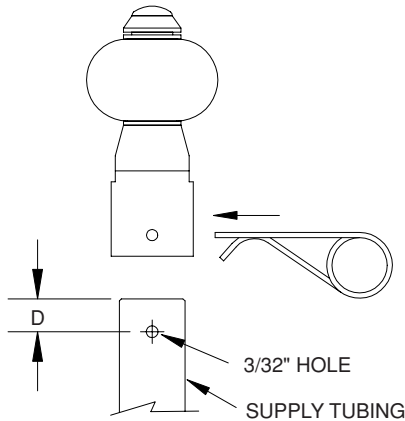


MODEL NUMBER	PIPE SIZE NPT FEMALE	NOZZLE CAP MODEL #	CAPACITIES (GPM) AT VARIOUS PRESSURES (psi)						
			20 psi	40 psi	60 psi	80 psi	100 psi	125 psi	150 psi
3/4 M7S1	3/4	1/8 GS1	0.98	1.39	1.70	1.96	2.2	2.5	2.7
3/4 M7S1.5	3/4	1/8 GS1.5	1.50	2.1	2.6	3.0	3.4	3.8	4.1
3/4 M7S2	3/4	1/8 GS2	2.0	2.8	3.5	4.0	4.5	5.0	5.5
3/4 M7S3	3/4	1/8 GS3	2.9	4.1	5.0	5.8	6.5	7.3	7.9
3/4 M7S3.5	3/4	1/8 GS3.5	3.4	4.8	5.9	6.8	7.6	8.5	9.3
3/4 M7S5	3/4	1/8 GS5	5.0	7.1	8.7	10.0	11.2	12.5	13.7
3/4 M7S6	3/4	1/8 GS6	6.0	8.5	10.4	12.0	13.4	15.0	16.4
1 M7S6.5	1	1/4 GS6.5	6.4	9.1	11.1	12.8	14.3	16.0	17.5
1 M7S7.5	1	1/4 GS7.5	7.4	10.5	12.8	14.8	16.5	18.5	20
1 M7S10	1	1/4 GS10	9.9	14.0	17.1	19.8	22	25	27
1 1/2 M7S9.5	1 1/2	3/8 GS9.5	9.4	13.3	16.3	18.8	21	24	26
1 1/2 M7S15	1 1/2	3/8 GS15	14.7	21	25	29	33	37	40
1 1/2 M7S16	1 1/2	1/2 GS16	16	23	28	32	36	40	44
1 1/2 M7S20	1 1/2	3/8 GS20	20	28	34	39	44	49	54
1 1/2 M7S22	1 1/2	3/8 GS22	22	31	38	44	49	55	60
1 1/2 M7S25	1 1/2	1/2 GS25	25	35	43	50	56	63	68
1 1/2 M7S32	1 1/2	1/2 GS32	32	45	55	64	72	80	88
1 1/2 M7S40	1 1/2	1/2 GS40	40	57	69	80	89	100	110

All references to G.P.M. mean U.S. G.P.M.



SANITARY CONNECTION
(INCLUDES STAINLESS STEEL
HITCH PIN FOR MOUNTING)



PRODUCT DESCRIPTION:

The TWK series rotating nozzles provide true 360° spray coverage in a very compact assembly. The bearing mechanism is self-lubricating and self-cleaning. This nozzle can be installed in any orientation and is effective in vessels up to 3 meters (10 feet) in diameter. The maximum recommended operating pressure is 100 psi at 180°F.

CONSTRUCTION:

Standard nozzle body material is 316 stainless steel. Nozzle balls are available in 316 stainless steel, PVDF (Kynar®), Teflon® and polypropylene. Other body and ball materials are available upon request.

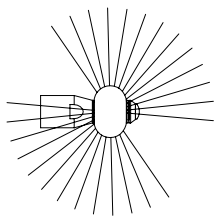
SPECIAL FEATURES:

- True 360° coverage
- Easy disassembly/assembly and cleaning
- FDA approved materials
- Keyed ball can not be installed backwards

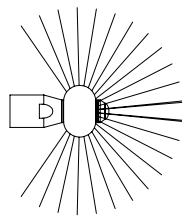
TYPICAL APPLICATIONS:

- Keg Washing
- Carboy/Jug Washing
- Spray Tank Washing
- Small Tank Rinsing
- Machine Clean-In-Place (C.I.P.)
- Barrel Washing/Rinsing

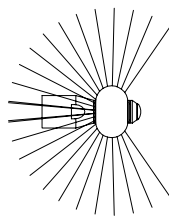
U.S. Patent No. 5,316,218



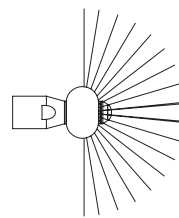
TWK360XX



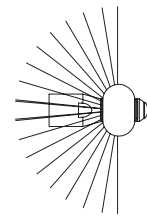
TWK270XX



TWK072XX



TWK180XX



TWK081XX

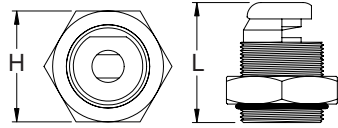
MODEL NUMBER	PIPE SIZE NPT FEMALE	MAXIMUM FREE PASSAGE (inches)	SANITARY TUBING SIZE*	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)												SPRAY COVERAGE (degrees)	Dim. A (inches)	Dim. L (inches)	Dim. D (inches)
				5 psi	7 psi	10 psi	15 psi	20 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi					
1/4TWK36050	1/4	0.063	1/2	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	360°	1.0	2.0	3/8	
1/4TWK27050	1/4	0.063	1/2	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	270°	1.0	2.0	3/8	
1/4TWK07250	1/4	0.063	1/2	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	270°	1.0	2.0	3/8	
1/4TWK18050	1/4	0.063	1/2	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	180°	1.0	2.0	3/8	
1/4TWK08150	1/4	0.063	1/2	1.77	2.1	2.5	3.1	3.5	4.3	5.0	5.6	6.1	7.1	7.9	180°	1.0	2.0	3/8	
3/8TWK36075	3/8	0.063	5/8	2.7	3.1	3.8	4.6	5.3	6.5	7.5	8.4	9.2	10.6	11.9	360°	1.25	2.5	3/8	
3/8TWK27075	3/8	0.063	5/8	2.7	3.1	3.8	4.6	5.3	6.5	7.5	8.4	9.2	10.6	11.9	270°	1.25	2.5	3/8	
3/8TWK07275	3/8	0.063	5/8	2.7	3.1	3.8	4.6	5.3	6.5	7.5	8.4	9.2	10.6	11.9	270°	1.25	2.5	3/8	
3/8TWK18075	3/8	0.063	5/8	2.7	3.1	3.8	4.6	5.3	6.5	7.5	8.4	9.2	10.6	11.9	180°	1.25	2.5	3/8	
3/8TWK08175	3/8	0.063	5/8	2.7	3.1	3.8	4.6	5.3	6.5	7.5	8.4	9.2	10.6	11.9	180°	1.25	2.5	3/8	
1/2TWK360100	1/2	0.063	3/4	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	360°	1.5	2.9	3/8	
1/2TWK270100	1/2	0.063	3/4	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	270°	1.5	2.9	3/8	
1/2TWK072100	1/2	0.063	3/4	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	270°	1.5	2.9	3/8	
1/2TWK180100	1/2	0.063	3/4	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	180°	1.5	2.9	3/8	
1/2TWK081100	1/2	0.063	3/4	3.5	4.2	5.0	6.1	7.1	8.7	10.0	11.2	12.2	14.1	15.8	180°	1.5	2.9	3/8	
3/4TWK360180	3/4	0.088	1	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	22	25	28	360°	2.0	3.9	1/2	
3/4TWK270180	3/4	0.088	1	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	22	25	28	270°	2.0	3.9	1/2	
3/4TWK072180	3/4	0.088	1	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	22	25	28	270°	2.0	3.9	1/2	
3/4TWK180180	3/4	0.088	1	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	22	25	28	180°	2.0	3.9	1/2	
3/4TWK081180	3/4	0.088	1	6.4	7.5	9.0	11.0	12.7	15.6	18.0	20	22	25	28	180°	2.0	3.9	1/2	

**Add prefix "S" (ie S 1/4 TWK36050) to model number for Sanitary Connection.

All references to G.P.M. mean U.S. G.P.M.

WA SERIES

Self-cleaning shower nozzles



DIMENSIONS

NOZZLE TYPE	Dim. H	Dim. L
WA	1 1/2	1 5/8

SPRAY CHARACTERISTICS:

Available in flat fan and solid stream (0 degree) models, these self-cleaning nozzles reduce shower maintenance. By reducing the supplied pressure, an internal piston retracts to purge

fibers and other suspended solids from the clogged nozzle.

CONSTRUCTION:

Standard material of construction is 316 stainless steel.

TYPICAL APPLICATIONS:

- Cleaning Fabric (wire)
- Cleaning Felts
- Pre-wetting Showers
- Knock-off Showers
- Lubrication Shower

SPRAY ANGLE @ 40psi	MODEL NUMBER	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)													
		20 psi	30 psi	40 psi	50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	120 psi	140 psi	180 psi	200 psi	250 psi
0° SOLID STREAM	WA0002	0.14	0.17	0.20	0.22	0.24	0.26	0.28	0.30	0.32	0.35	0.37	0.42	0.45	0.50
	WA0006	0.42	0.52	0.60	0.67	0.73	0.79	0.85	0.90	0.95	1.04	1.12	1.27	1.34	1.50
	WA0008	0.57	0.69	0.80	0.89	0.98	1.06	1.13	1.20	1.26	1.39	1.50	1.70	1.79	2.0
	WA0010	0.71	0.87	1.00	1.12	1.22	1.32	1.41	1.50	1.58	1.73	1.87	2.12	2.24	2.5
15°	WA1506	0.42	0.52	0.60	0.67	0.73	0.79	0.85	0.90	0.95	1.04	1.12	1.27	1.34	1.50
30°	WA3005	0.35	0.43	0.50	0.56	0.61	0.66	0.71	0.75	0.79	0.87	0.94	1.06	1.12	1.25
	WA3014	0.99	1.21	1.40	1.57	1.71	1.85	2.0	2.1	2.2	2.4	2.6	3.0	3.1	3.5
40°	WA4012	0.85	1.04	1.20	1.34	1.47	1.59	1.70	1.80	1.90	2.1	2.2	2.5	2.7	3.0
	WA4014	0.99	1.21	1.40	1.57	1.71	1.85	2.0	2.1	2.2	2.4	2.6	3.0	3.1	3.5
	WA4032	2.3	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.1	5.5	6.0	6.8	7.2	8.0
45°	WA4516	1.13	1.39	1.60	1.79	2.0	2.1	2.3	2.4	2.5	2.8	3.0	3.4	3.6	4.0
	WA4525	1.77	2.2	2.5	2.8	3.1	3.3	3.5	3.8	4.0	4.3	4.7	5.3	5.6	6.3
50°	WA5032	2.3	2.8	3.2	3.6	3.9	4.2	4.5	4.8	5.1	5.5	6.0	6.8	7.2	8.0
60°	WA6016	1.13	1.39	1.60	1.79	2.0	2.1	2.3	2.4	2.5	2.8	3.0	3.4	3.6	4.0
	WA6038	2.7	3.3	3.8	4.2	4.7	5.0	5.4	5.7	6.0	6.6	7.1	8.1	8.5	9.5
80°	WA8011	0.78	0.95	1.10	1.23	1.35	1.46	1.56	1.65	1.74	1.91	2.1	2.3	2.5	2.8
	WA8030	2.1	2.6	3.0	3.4	3.7	4.0	4.2	4.5	4.7	5.2	5.6	6.4	6.7	7.5
	WA8046	3.3	4.0	4.6	5.1	5.6	6.1	6.5	6.9	7.3	8.0	8.6	9.8	10.3	11.5
110°	WA11011	0.78	0.95	1.10	1.23	1.35	1.46	1.56	1.65	1.74	1.91	2.1	2.3	2.5	2.8
120°	WA12008	0.57	0.69	0.80	0.89	0.98	1.06	1.13	1.20	1.26	1.39	1.50	1.70	1.79	2.0
130°	WA13016	1.13	1.39	1.60	1.79	2.0	2.1	2.3	2.4	2.5	2.8	3.0	3.4	3.6	4.0
	WA13025	1.77	2.2	2.5	2.8	3.1	3.3	3.5	3.8	4.0	4.3	4.7	5.3	5.6	6.3

Standard thread size is 1 1/8" - 20.

WN SERIES

Solid stream shower nozzles

SPRAY CHARACTERISTICS:

BEX WN series spray nozzles are custom designed to deliver a solid stream of liquid for high precision applications.

CONSTRUCTION:

Standard material of construction is 316 stainless steel. Other materials available by special order.

TYPICAL APPLICATIONS:

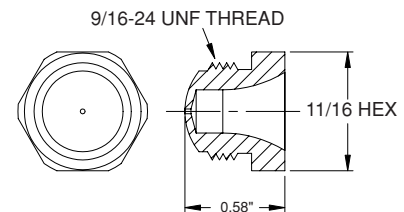
Uses include cleaning and washing of felts, suction rolls, fabric (wire), and other areas that require flow control and precision delivery of the nozzle stream.

OTHER NOZZLES

MODEL NUMBER	ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)						
		40 psi	60 psi	80 psi	100 psi	300 psi	600 psi	900 psi
WN14	0.014	0.320	0.392	0.453	0.506	0.876	1.239	1.518
WN28	0.028	0.110	0.135	0.156	0.174	0.301	0.426	0.522
WN33	0.033	0.160	0.196	0.226	0.253	0.438	0.620	0.759
WN40	0.040	0.230	0.282	0.325	0.364	0.630	0.891	1.091
WN55	0.055	0.400	0.490	0.566	0.632	1.095	1.549	1.897
WN70	0.070	0.670	0.821	0.948	1.059	1.835	2.595	3.18
WN94	0.094	1.200	1.470	1.697	1.897	3.29	4.65	5.69
WN125	0.125	2.000	2.449	2.828	3.16	5.48	7.75	9.49

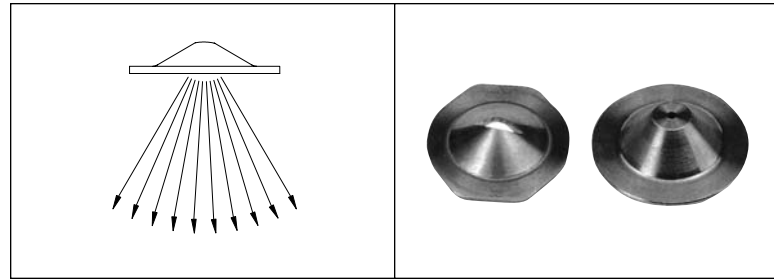
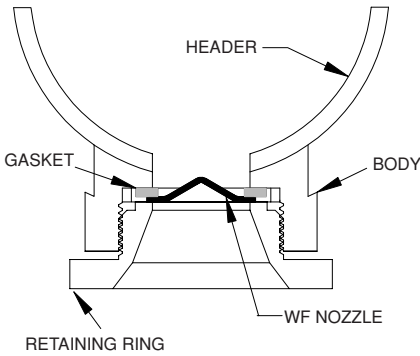


NOTE: Optional orifice sizes and other materials of construction are available on a special order basis. Specifications subject to change without prior notification.



Self-aligning disc shower nozzles

WF SERIES



SPRAY CHARACTERISTICS:

Available in 30° and 60° flay V-shaped spray patterns, as well as zero (0) degree solid stream spray.

CONSTRUCTION:

Standard material of construction for the spray disc is 317L stainless steel. A gasket is available for sealing the face between the nozzle disc and the body.

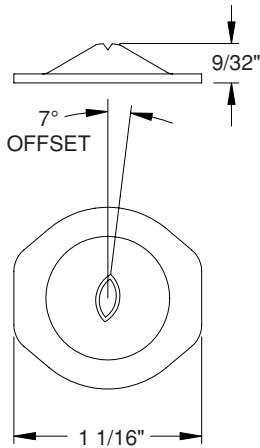
TYPICAL APPLICATIONS:

WF Series shower nozzles are designed to work in a number of commercially available "shower" bar systems where a self-aligning replaceable nozzle disc is required.

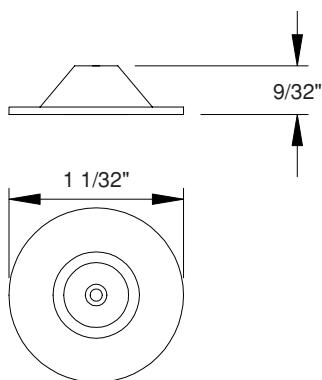
The back protruding design permits the nozzle orifice to be cleaned from inside the header, using a rotating brush.

All flat V-shaped spray models are pre-aligned to a standard 7° offset angle to allow for spray overlap without interference from the adjacent nozzles. (Refer to drawings shown below).

WF FLAT STREAM NOZZLE



WF SOLID STREAM NOZZLE

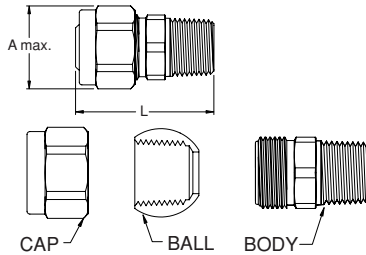
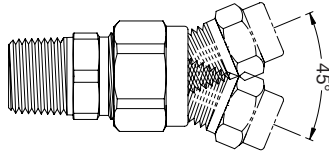


SPRAY ANGLE @ 40psi	MODEL NUMBER	CAPACITIES (GPM) AT VARIOUS PRESSURES (psi)							
		20 psi	40 psi	60 psi	80 psi	100 psi	200 psi	400 psi	600 psi
0° SOLID STREAM	WA00004	0.03	0.04	0.05	0.06	0.06	0.09	0.13	0.15
	WF00007	0.05	0.07	0.09	0.10	0.11	0.16	0.22	0.27
	WF00009	0.06	0.09	0.11	0.13	0.14	0.20	0.28	0.35
	WF0001	0.09	0.13	0.16	0.18	0.21	0.29	0.41	0.50
	WF0002	0.16	0.23	0.28	0.33	0.36	0.51	0.73	0.89
	WF0003	0.23	0.33	0.40	0.47	0.52	0.74	1.04	1.28
	WF0004	0.30	0.43	0.53	0.61	0.68	0.96	1.4	1.7
	WF0008	0.56	0.79	0.97	1.12	1.25	1.77	2.5	3.1
	WF0012	0.88	1.24	1.52	1.75	1.96	2.8	3.9	4.8
	WF0020	1.40	2.0	2.4	2.8	3.1	4.4	6.3	7.7
30°	WF3002	0.16	0.23	0.28	0.33	0.4	0.5	0.7	0.9
	WF3003	0.23	0.3	0.4	0.5	0.5	0.7	1.0	1.3
	WF3004	0.3	0.4	0.5	0.6	0.7	1.0	1.4	1.7
	WF3006	0.43	0.61	0.75	0.86	0.96	1.36	1.93	2.4
	WF3008	0.56	0.79	0.97	1.12	1.25	1.77	2.5	3.1
	WF3010	1.40	1.98	2.4	2.8	3.1	4.4	6.3	7.7
	WF3012	0.88	1.24	1.52	1.75	2.0	2.8	3.9	4.8
	WF3016	1.14	1.61	2.0	2.3	2.5	3.6	5.1	6.2
	WF3020	1.40	1.98	2.4	2.8	3.1	4.4	6.3	7.7
	60°	WF6002	0.16	0.23	0.28	0.33	0.36	0.51	0.73
WF6003		0.23	0.33	0.40	0.47	0.52	0.74	1.04	1.28
WF6004		0.30	0.43	0.53	0.61	0.68	0.96	1.36	1.67
WF6006		0.43	0.61	0.75	0.86	0.96	1.36	1.93	2.4
WF6008		0.56	0.79	0.97	1.12	1.25	1.77	2.5	3.1
WF6010		0.72	1.02	1.25	1.44	1.61	2.3	3.2	4.0
WF6012		0.88	1.24	1.52	1.75	1.96	2.8	3.9	4.8
WF6016		1.14	1.61	1.97	2.3	2.5	3.6	5.1	6.2
WF6020		1.40	1.98	2.4	2.8	3.1	4.4	6.3	7.7
WF6025		1.84	2.6	3.2	3.7	4.1	5.8	8.2	10.1
WF6031		2.2	3.1	3.8	4.4	4.9	6.9	9.8	12.0
WF6040		2.8	4.0	4.9	5.7	6.3	8.9	12.6	15.5
WF6049		3.5	4.9	6.0	6.9	7.7	11.0	15.5	19.0
WF6077		5.6	7.9	9.7	11.2	12.5	17.7	25	31
WF6099	7.0	9.9	12.1	14.0	15.7	22	31	38	
WF60124	8.8	12.4	15.2	17.5	19.6	28	39	48	

All references to G.P.M. mean U.S. G.P.M.

MAJ SERIES

Machined adjustable joints



TYPICAL APPLICATIONS:

The MAJ series of adjustable joints allow spray nozzles or other threaded items to be rotated and tilted to obtain the desired spray pattern or orientation, without having to disturb the surrounding piping. They may also be used within piping systems as an adjustable union type connection.

CONSTRUCTION:

The unit consists of a male inlet section and a female outlet section, held together by a threaded cap. The cap may be loosened to change the angle of adjustment between the inlet and outlet sections. Maximum recommended operating pressure is 300 psi. Standard materials are brass, 303 stainless steel, and 316 stainless steel.

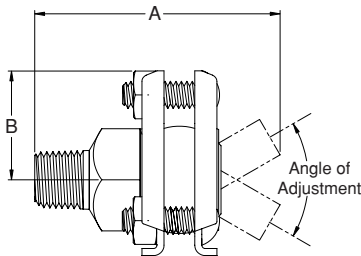
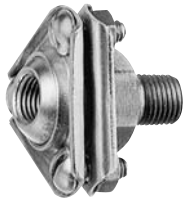
DIMENSIONS

MODEL NUMBER	Inlet Pipe Size NPT	Outlet Pipe Size NPT	Dim. A (max) (inches)	Dim. L (max) (inches)
1/8MAJ	1/8 male	1/8 female	0.97	1.4
1/4MAJ	1/4 male	1/4 female	1.1	1.6
3/8MAJ	3/8 male	3/8 female	1.4	1.8
1/2MAJ	1/2 male	1/2 female	1.7	2.2
3/4MAJ	3/4 male	3/4 female	1.9	2.6

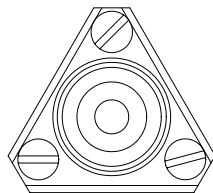
Other combinations are available.

AJ SERIES

Flanged adjustable joints



Inlet of ball is hexagonal for easy holding



TYPICAL APPLICATIONS:

To rotate and tilt spray nozzles, to obtain a desired positioning of a spray pattern, without having to disturb surrounding piping. May also be used within piping systems as an adjustable union type connection. Maximum recommended operating pressure is 120 p.s.i.

CONSTRUCTION:

The unit consists of a male inlet section and a female outlet section, held together by a flange assembly. Locking screws may be loosened to change the angle of adjustment between the inlet and outlet sections. Standard materials are brass and 303 or 316 stainless steel with 304 stainless steel flanges.

DIMENSIONS (inches)

MODEL NUMBER	INLET PIPE SIZE	OUTLET PIPE SIZE	Dim. A (inches)	Dim. B (inches)	Maximum Angle of Adjustment
1/8 x 1/8 AJ	1/8 male	1/8 female	1 3/4	1	60°
1/4 x 1/8 AJ	1/4 male	1/8 female	1 3/4	1	60°
1/4 x 1/4 AJ	1/4 male	1/4 female	1 3/4	1	60°
3/8 x 1/4 AJ	3/8 male	1/4 female	1 3/4	1	60°
3/8 x 3/8 AJ	3/8 male	3/8 female	1 3/4	1	45°
1/2 x 1/2 AJ	1/2 male	1/2 female	2 1/2	1 1/2	50°
1/8 x 3/4 AJ	1/8 male	3/4 female	2 1/2	1 1/2	50°
3/4 x 1/2 AJ	3/4 male	1/2 female	2 5/8	1 1/2	50°
3/4 x 3/4 AJ	3/4 male	3/4 female	2 5/8	1 1/2	40°

STA SERIES

Flow stabilizers



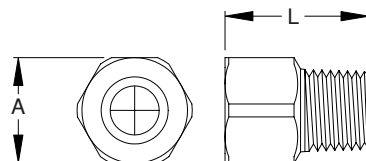
TYPICAL APPLICATIONS:

When liquid in a pipe emerges from elbows or tees, the resulting flow is often distorted. These flow stabilizers help to eliminate flow distortion, resulting in a more even and consistent spray pattern.

CONSTRUCTION:

This unit consists of a body and an internal vane. Available in 1/8", 1/4", 3/8" and 1/2" NPT sizes, with a male inlet and female outlet connection. Standard materials are brass, 303 and 316 stainless steel.

DIMENSIONS



MODEL NUMBER	Inlet Pipe Size NPT	Outlet Pipe Size NPT	Dim. A (inches)	Dim. L (inches)
1/8STA	1/8 male	1/8 female	9/16 HEX	7/8
1/4STA	1/4 male	1/4 female	11/16 HEX	1
3/8STA	3/8 male	3/8 female	13/16 HEX	1 1/8
1/2STA	1/2 male	1/2 female	1 HEX	1 3/8

See pages 2, 3 and 4 for engineering data and spray coverage.

High impact flat spray nozzles

SN4224 SERIES



TYPICAL APPLICATIONS:

SN4224 is a specially designed spray nozzle that provides high impact per unit area. This flat spray nozzle works particularly well for screen-filters, pulp "knock-off" showers and other

applications where loose scale and debris removal are required.

CONSTRUCTION:

SN4224 is available in 316 stainless steel with an 1/8" orifice and a 3/8" NPT male fitting

MODEL NUMBER	ORIFICE DIAMETER (inches)	CAPACITY (GPM) AT VARIOUS PRESSURES (psi)				
		20 psi	40 psi	60 psi	80 psi	100 psi
SN4224	0.125	2.1	2.9	3.6	4.1	4.6

All references to G.P.M. mean U.S. G.P.M.

CHECK VALVES



TYPICAL APPLICATIONS:

Check valves are used in line with many spray nozzles when the application requires the complete shut-off of flow while maintaining full line pressure. The spring loaded ball-type design provides a drip-free seal with shut-off pressures of 5, 10 and 20 psi.

CONSTRUCTION:

The unit consists of a two-piece body, an internal spring and a shut-off stainless steel ball. Available in 1/8", 1/4", 3/8" and 1/2" NPT sizes. Standard materials are brass, 303SS and 316SS.

SHUT OFF PSI	MODEL NUMBER			
5	1/8CV5	1/4CV5	3/8CV5	1/2CV5
10	1/8CV10	1/4CV10	3/8CV10	1/2CV10
20	1/8CV20	1/4CV20	3/8CV20	1/2CV20

SPLIT EYELETS



TYPICAL APPLICATIONS:

Anywhere an alternate connection to pipe is desired. Eliminates:

- Threading
- Brazing
- Welding

CONSTRUCTION:

The split eyelet consists of a top and bottom clamp, two retaining bolts, an outlet body and an O-ring. Clamps and retaining bolts are zinc-plated steel. Standard materials for the body are brass, 303 stainless steel and 316 stainless steel. The O-ring seal is Buna-N.

PIPE SIZE	MODELS (NPT OUTLET SIZE)			MAX. FLOW	DRILL SIZE
	1/8	1/4	3/8		
1/2	1/2x1/8FSE	1/2x1/4FSE		3.5 GPM	9/32 DRILL
3/4	3/4x1/8FSE	3/4x1/4FSE		3.5 GPM	9/32 DRILL
1	1x1/8FSE	1x1/4FSE		3.5 GPM	9/32 DRILL
1-1/4	1-1/4x1/8FSE	1-1/4x1/4FSE	1-1/4x3/8FSE	19 GPM	11/16 DRILL
1-1/2	1-1/2x1/8FSE	1-1/2x1/4FSE	1-1/2x3/8FSE	19 GPM	11/16 DRILL



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Please explain your application:

Liquid being sprayed: _____ Liquid temperature: _____

PSI: _____ GPM required: _____

Nozzle spray coverage: _____ Nozzle material: _____

Nozzle spray pattern: _____ Thread size: _____

Spray distance from nozzle: _____

If you need further explanation or would like to provide a sketch, use the area below:

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