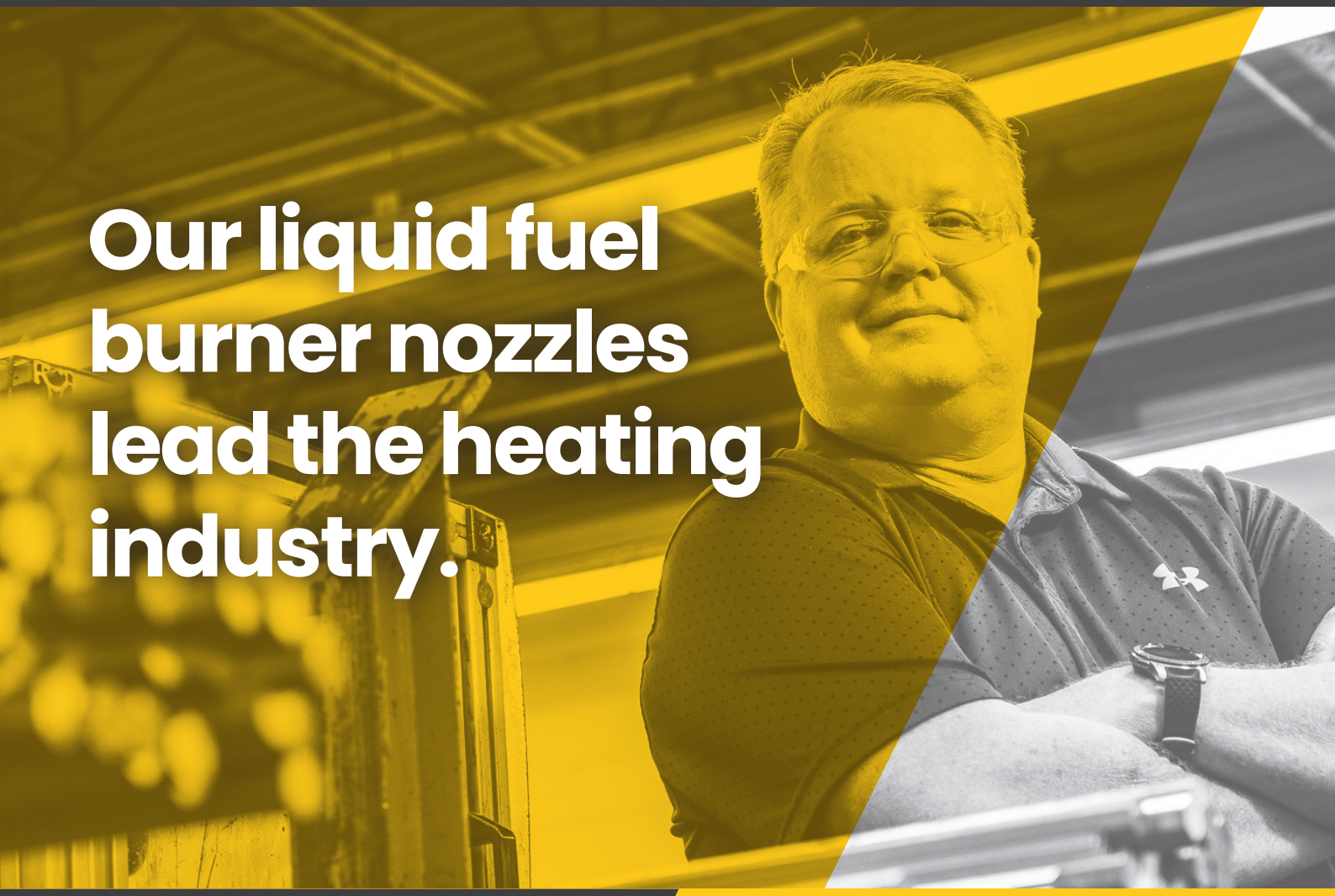
Combustion Nozzles & Accessories



Our liquid fuel burner nozzles lead the heating industry.

Precision Tested.
People Trusted.

DELAVAN®
SPRAY TECHNOLOGIES

Delavan® Spray Technologies Continually Meets Your Manufacturing Challenges.

Delavan® Spray Technologies, part of R.W. Beckett Corporation, is a world leader in the design and manufacture of high quality spray nozzles and fluid handling systems. Since the company was founded back in 1936, the Delavan® name has always stood for quality, flexibility, and reliability.

We Meet the challenge with State of the Art Manufacturing, Research and Quality Controls

Delavan nozzles are built according to precise spray controls and to high quality fabrication standards. Delavan nozzles are 100% tested for flow rate, spray angle, and spray quality using our proprietary Delavision™ system that combines digital consistency with the precision of the laser to produce the highest quality, most reliable, and most consistent nozzles available.

Whether you are an engineer designing heating equipment, a service technician performing annual service, or have a unique application, remember Delavan for assured quality and call on our knowledge and experience whenever you have a nozzle application problem.

Precision Tested. People Trusted.

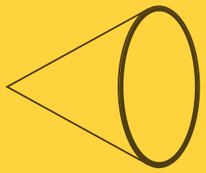
We design precision nozzles for combustion efficiency.

Delavan is a leader in the HVAC industry designing and manufacturing nozzles for special industrial combustion applications and can provide spray solutions that meet the most demanding customer requirements. We specialize in assisting original equipment manufacturers in designing and specifying the best nozzles to fit the unique applications required for emissions and efficiency.

Delavan is a leader in the industry because we have developed training materials and conducted programs to educate the service technician. Due to these efforts, our nozzles are distributed globally and found regionally with our sales partners.

Combustion Nozzles

TYPE XA NOZZLE



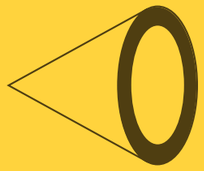
Extra Hollow Cone

Spray Angles
45°-80°

Flow Rate:
0.40-1.25 GPH

- *Bright Orange Vial*
- *Extra Hollow Cone*
- *Mainly used on burners with a hollow cone air pattern (up to 2.00 GPH)*
- *Droplet distribution is concentrated on the outside of the cone*
- *Results in good ignition and low-noise combustion*

TYPE A NOZZLE



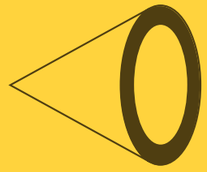
Hollow Cone

Spray Angles
30°-90°

Flow Rate:
0.40-50.00 GPH

- *Red Vial*
- *Hollow Cone*
- *Mainly used on burners with a hollow cone air pattern (up to 2.00 GPH)*
- *Droplet distribution is concentrated on the outside of the cone*
- *Results in good ignition and low-noise combustion*

TYPE DOF-A NOZZLE



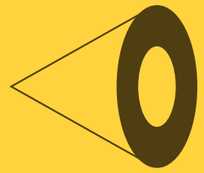
Hollow Cone

Spray Angle
45°-90°

Flow Rate:
0.40-0.85 GPH

- *Black Vial*
- *Low capacity nozzles designed to minimize the plugging problems*
- *Interior design flushes contaminants through limiting buildup*
- *Interchange with other hollow cone nozzles*
- *Available in 0.40 GPH up to 0.85 GPH*

TYPE W NOZZLE



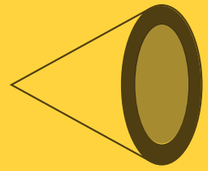
Semi-Hollow Cone

Spray Angles
30°-90°

Flow Rate:
0.40-8.00 GPH

- *Green Vial*
- *Neither truly hollow nor solid*
- *Used in place of either solid or hollow cone nozzles between 0.40 and 8.00 GPH, regardless of the burner's air pattern*
- *Lower flow rates tend to be more hollow*

TYPE MH NOZZLE



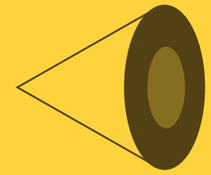
Semi-Hollow Cone

Spray Angles
70°

Flow Rate: 0.579

- *Burnt Orange Vial*
- *Low capacity nozzles designed for mobile home use*
- *Minimizes plugging problems associated with low flow rates*

TYPE AR-D NOZZLE



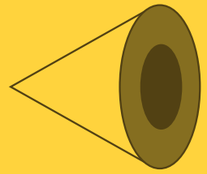
Semi Hollow Cone

Spray Angle
45°-80°

Flow Rate:
0.50-2.00 GPH

- *Light Grey Vial*
- *Solid Cone*
- *Similar to Type B but with slightly lower concentration of droplets in the center of the cone*
- *High performance in burners of low up to medium capacity (up to 2.00 GPH)*

TYPE R-D NOZZLE



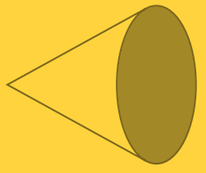
Semi Solid Cone

Spray Angles
45°-80°

Flow Rate:
0.50-2.00 GPH

- *Dark Grey Vial*
- *High concentration of droplets in the center of the spray cone*
- *Recommended for burners with highly concentrated solid air pattern*
- *Average droplet size is slightly coarser than Type B (up to flows of 2.00 GPH)*

TYPE SS NOZZLE



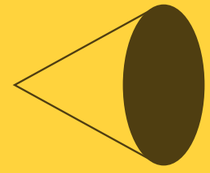
Semi-Solid Cone

Spray Angles
60°-80°

Flow Rate:
0.50-2.00 GPH

- *Powder Blue Vial*
- *Semi-Solid nozzle (.50 - 2.00 GPH)*
- *60°, 70°, and 80° spray angles*
- *Interchanges with other manufacturer's Semi-Solid nozzles*

TYPE DOF-B NOZZLE



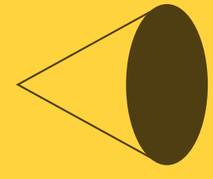
Solid Cone

Spray Angle
45°-90°

Flow Rate:
0.40-0.85 GPH

- *Yellow Vial*
- *Low capacity nozzles designed to minimize the plugging problems*
- *Interior design flushes contaminants through limiting buildup*
- *The DOF type can be used in both hollow and solid cone nozzles*
- *Available in 0.40 GPH up to 0.85 GPH*

TYPE B NOZZLE



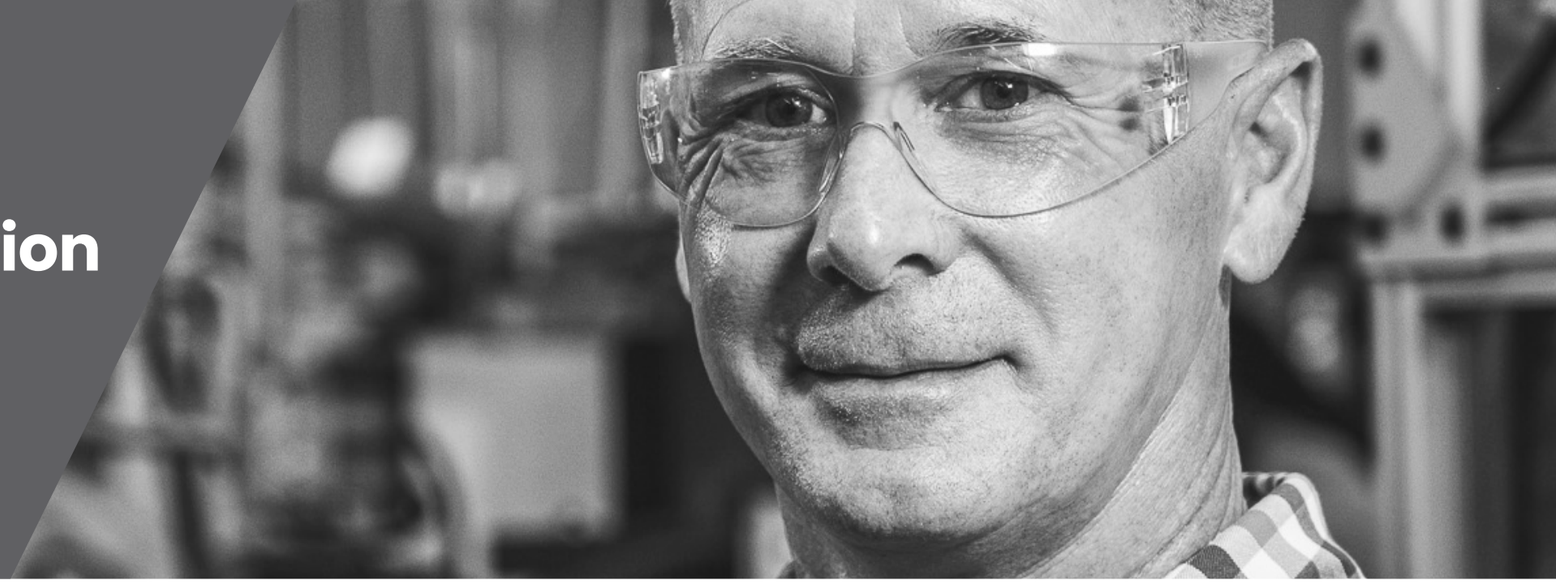
Solid Cone

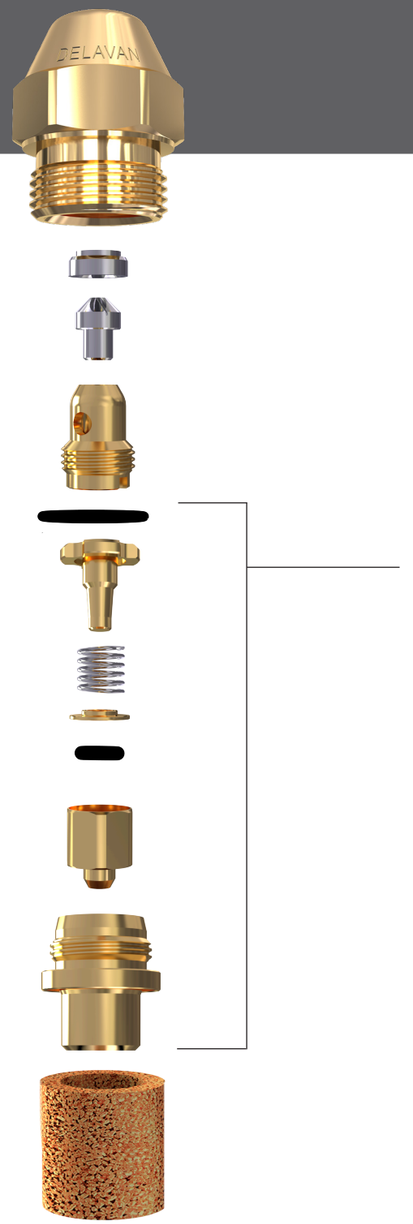
Spray Angles
30°-90°

Flow Rate:
0.40-50.00 GPH

- *Blue Vial*
- *Solid Cone*
- *Produce a spray that distributes droplets fairly uniformly throughout the complete pattern*
- *Spray pattern becomes progressively more hollow at higher flow rates (above 8.00 GPH)*
- *Provides smooth ignition and efficient combustion, particularly in larger burners*

The ProTek® Nozzle Design Reduces Combustion Pollution for Cleaner Heating

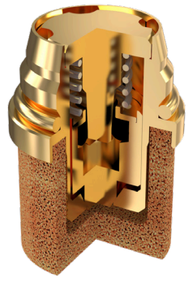




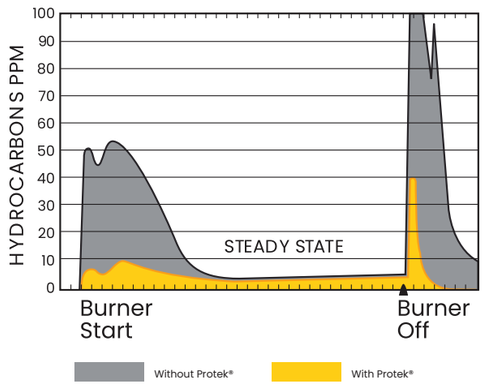
DELAVAN ProTek® NOZZLE SYSTEM

The Delavan ProTek® Nozzle System provides the first step into the future of Clean Air Technology™. This unique, patented system from Delavan provides significant reductions in combustion pollutant for cleaner air. The system includes a factory-installed, one-piece valve component which reduces smoke and oil smell in the off cycle by preventing oil after-drip from the nozzle. Also, the reduction of smoke (carbon and soot) helps maintain burner setup efficiency and extend the time period between appliance cleanups.

Installation is fast and easy; there's no need to increase pump supply pressure at installation because there's no pressure drop. Plus ProTek Nozzle Systems maintain the same flow pattern and flow rating characteristics of comparable rated Delavan nozzles.



The ProTek is available in either a factory-installed, complete system or as a separate valve component to replace the standard filter.

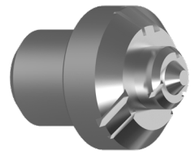


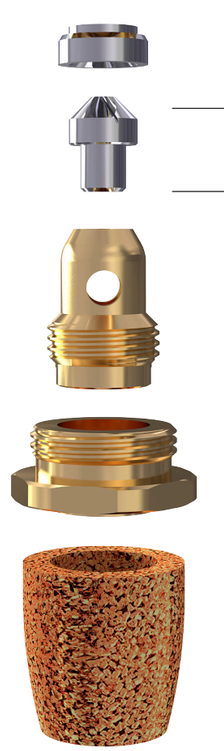
The ProTek Nozzle System has been thoroughly tested. In the tests, approximately seven years of "on/off" cycle operation simulation in the laboratory with no failures. A total of 107,000 cycles were recorded. After the first 11,350 cycles, the cut-on pressures shifted upward an average of 3.0 PSI. The cut off pressure shifted up an average of 7.75 PSI. After this initial seating process, there was very little change of either "on" or "off" pressures. Very little change in nozzle flow was noted after 107,000 cycles, either. Additional testing has included pressure tests up to 500 PSI (34,5 BAR), as well as combustion tests and tests with various fuels such as kerosene, #2, and heavier oils. Detailed test results are available from Delavan Technical Services.

Operating Pressures

Minimum Operating Pressures						
Valve Part #	Supply Pump		Valve Open		Valve Close	
	PSI	(BAR)	PSI	(BAR)	PSI	(BAR)
60030-001	135.0	(9,3)	125.0	(8,6)	65.0	(4,5)
60030-002	100.0	(7,0)	60.0	(4,1)	45.0	(3,1)

Del-O-Flo™ Technology Dramatically Reduces Plugging in Low Flow Applications





Low flow appliances represent a growing segment of the oil heating market as manufacturers work to develop more efficient systems. While the future looks good for low flow appliances, the present is rife with headaches for contractors and service personnel. “Particulates in the oil tend to be more of a problem in the low flow applications,” says Jeff Stembridge, Delavan Design Engineer. “Because of the reduced flow rates, particulates can easily plug a nozzle, either reducing or restricting flow.” The result can be increased sooting, inefficient operation, or a total shutdown of the heating system. Some companies have resorted to monthly nozzle changes, increased filtration, or both.

Historically, extra filtration has been the only remedy available for low gallonage applications. The Del-O-Flo™ nozzle reduces plugging with patented technology that forces particulates and other contaminants through and out the nozzle. The Del-O-Flo™ contains an extra-fine filter that stops larger particles that cause the problems in low flow situations. The patented Del-O-Flo™ design keeps these particles in suspension and forces them out without plugging.

Delavan Del-O-Flo® Slots

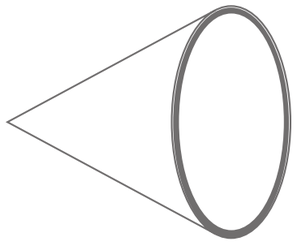
Standard Hollow Cone Slots

With the Del-O-Flo™ nozzle, fluid flows through the filter, into the slots, and is metered prior to exiting. The slots are designed for force fluid into a swirling motion where particles are kept in suspension. The nozzle contains short slot openings that are perpendicular to fluid flow. These short slots keep the fluid from slowing and maintain turbulence, which keeps particulates from collecting, settling, or clogging the nozzle.

Under identical test situations, a standard nozzle produced contamination buildup which causes plugging while the Del-O-Flo™ remained contaminant-free.

Delavan Del-O-Flo® **Standard**

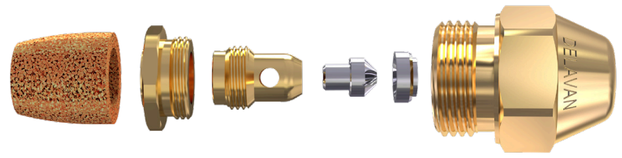
Type XA Nozzles



EXTRA HOLLOW-CONE Type XA nozzles are mainly used on burners with a hollow cone air pattern and for through puts up to 1.25 GPH. The droplet distribution is concentrated on the outside of the cone and results in good ignition and low-noise combustion.

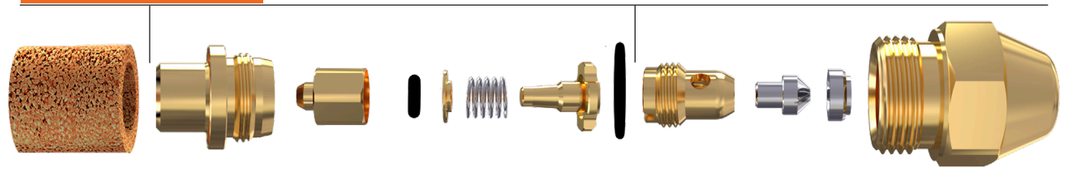
Type XA Standard

Flow Rate: 0.40 - 1.25 GPH
Spray Angles 45°-80°



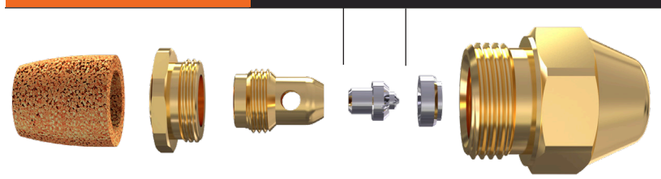
Type XA With Protek®

Flow Rate: 0.40 - 1.25 GPH
Spray Angles 45°-80°



Type XA with Del-O-Flo™ + Type DOF-A

Flow Rate: 0.40 - 0.85 GPH Spray Angles 45°-80°



Nozzle Type XA

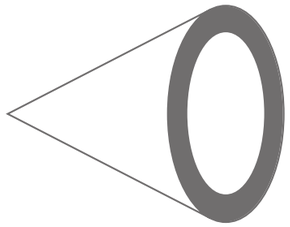
Angles and Availability						Flow Rate Gallons per Hour						
30°	45°	60°	70°	80°	90°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
						.40	0.44	0.48	0.51	0.53	0.57	0.69
						.50	0.55	0.60	0.63	0.66	0.71	0.87
						.60	0.66	0.72	0.76	0.79	0.85	1.04
						.65	0.71	0.78	0.82	0.86	0.92	1.13
						.75	0.82	0.90	0.95	0.99	1.06	1.30
						.85	0.93	1.02	1.08	1.12	1.20	1.47
						.90	0.99	1.08	1.14	1.19	1.27	1.56
						1.00	1.10	1.20	1.26	1.32	1.41	1.73
						1.10	1.20	1.32	1.39	1.46	1.56	1.91
						1.20	1.31	1.44	1.52	1.59	1.70	2.08
						1.25	1.37	1.51	1.58	1.65	1.77	2.17

☐ Normally Stocked ☐ Limited Inventory ☐ Special Order

Nozzle Type XA

Flow Rate	Hex 1 (Kg/Hr)
.40	1.50
.50	1.90
.55	2.15
.60	2.30
.65	2.50
.70	2.70
.75	2.90
.80	3.10
.85	3.25
.90	3.45
1.00	3.85
1.10	4.25
1.50	4.60
1.25	4.80

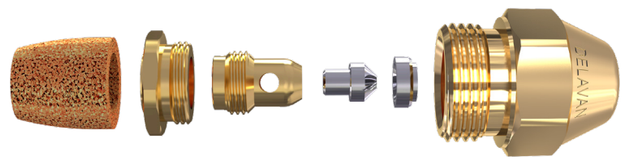
Type A Nozzles



HOLLOW-CONE Type A nozzles are mainly used on burners with a hollow cone air pattern and for through puts up to 50.00 GPH. The droplet distribution is concentrated on the outside of the cone and results in good ignition and low-noise combustion.

Type A Standard

Flow Rate: 0.40 - 50.00 GPH
Spray Angles 30°-90°

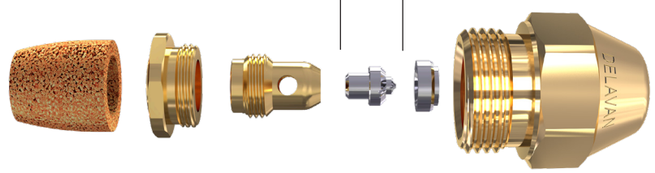


Type A With Protek®

Flow Rate: 0.40 -2.00 GPH
Spray Angles 30°-90°

Type A With Del-O-Flo™ + Type DOF-A

Flow Rate: 0.40 - 0.85 GPH Spray Angles 30°-80°



Types A

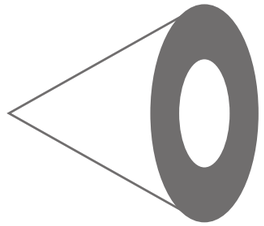
Angles and Availability						Flow Rate Gallons per Hour						
30°	45°	60°	70°	80°	90°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
						.40	0.44	0.48	0.51	0.53	0.57	0.69
						.50	0.55	0.60	0.63	0.66	0.71	0.87
						.60	0.66	0.72	0.76	0.79	0.85	1.04
						.65	0.71	0.78	0.82	0.86	0.92	1.13
						.75	0.82	0.90	0.95	0.99	1.06	1.30
						.85	0.93	1.02	1.08	1.12	1.20	1.47
						.90	0.99	1.08	1.14	1.19	1.27	1.56
						1.00	1.10	1.20	1.26	1.32	1.41	1.73
						1.10	1.20	1.32	1.39	1.46	1.56	1.91
						1.20	1.31	1.44	1.52	1.59	1.70	2.08
						1.25	1.37	1.51	1.58	1.65	1.77	2.17
						1.35	1.48	1.63	1.71	1.79	1.91	2.34
						1.50	1.64	1.81	1.90	1.98	2.12	2.60
						1.65	1.81	1.99	2.09	2.18	2.33	2.86
						1.75	1.92	2.11	2.21	2.32	2.47	3.03
						2.00	2.19	2.41	2.53	2.65	2.83	3.46
						2.25	2.46	2.71	2.85	2.98	3.18	3.90
						2.50	2.74	3.01	3.16	3.31	3.54	4.33
						2.75	3.01	3.31	3.48	3.64	3.89	4.76
						3.00	3.29	3.61	3.79	3.97	4.24	5.20
						3.25	3.56	3.91	4.11	4.30	4.60	5.63
						3.50	3.83	4.21	4.43	4.63	4.95	6.06
						4.00	4.38	4.82	5.06	5.29	5.66	6.93
						4.50	4.93	5.42	5.69	5.95	6.36	7.79
						5.00	5.48	6.02	6.32	6.61	7.07	8.66
						5.50	6.02	6.62	6.96	7.28	7.78	9.53
						6.00	6.57	7.22	7.59	7.94	8.49	10.39
						6.50	7.12	7.83	8.22	8.60	9.19	11.26
						7.00	7.67	8.43	8.85	9.26	9.90	12.12
						7.50	8.22	9.03	9.49	9.92	10.61	12.99
						8.00	8.76	9.63	10.12	10.58	11.31	13.86
						8.50	9.31	10.24	10.75	11.24	12.02	14.72
						9.00	9.86	10.84	11.38	11.91	12.73	15.59
						10.00	10.95	12.04	12.65	13.23	14.14	17.32
						11.00	12.05	13.25	13.91	14.55	15.56	19.05
						12.00	13.15	14.45	15.18	15.87	16.97	20.78
						13.00	14.24	15.65	16.44	17.20	18.38	22.52
						14.00	15.34	16.86	17.71	18.52	19.80	24.25
						15.00	16.43	18.06	18.97	19.84	21.21	25.98
						16.00	17.53	19.27	20.24	21.17	22.63	27.71
						18.00	19.72	21.67	22.77	23.81	25.46	31.18
						20.00	21.91	24.08	25.30	26.46	28.28	34.64
						22.00	24.10	26.49	27.83	29.10	31.11	38.11
						24.00	26.29	28.90	30.36	31.75	33.94	41.57
						26.00	28.48	31.31	32.89	34.39	36.77	45.03
						28.00	30.67	33.72	35.42	37.04	39.60	48.50
						30.00	32.86	36.12	37.95	39.69	42.43	51.96
						32.00	35.05	38.53	40.48	42.33	45.25	55.43
						35.00	38.34	42.15	44.27	46.30	49.50	60.62
						40.00	43.82	48.17	50.60	52.92	56.57	69.28
						45.00	49.30	54.19	56.92	59.53	63.64	77.94
						50.00	54.77	60.21	63.25	66.14	70.71	86.60

Normally Stocked Limited Inventory Special Order

Nozzle Type A

Flow Rate	Hex 1 (Kg/Hr)
.40	1.50
.50	1.90
.55	2.15
.60	2.30
.65	2.50
.70	2.70
.75	2.90
.80	3.10
.85	3.25
.90	3.45
1.00	3.85
1.10	4.25
1.50	4.60
1.25	4.80
1.35	5.20
1.50	5.75
1.65	6.30

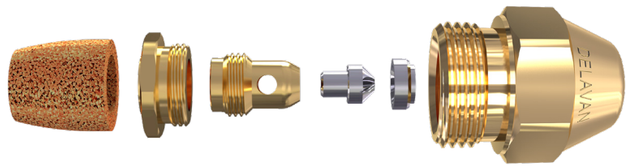
Type W Nozzles



Semi-Hollow Cone Type W nozzles are neither truly hollow nor solid. These nozzles frequently can be used in place of either solid or hollow cone nozzles between 0.40 and 8.00 GPH, regardless of the burner's air pattern. The lower flow rates tend to be more hollow.

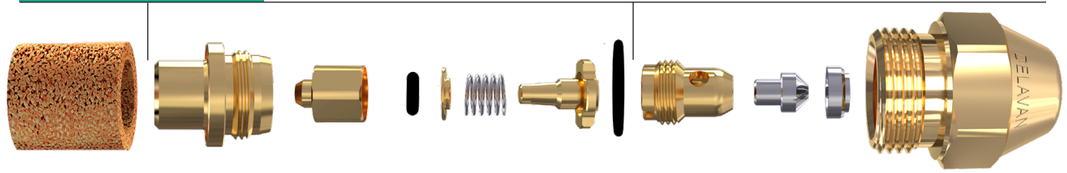
Type W Standard

Flow Rate: 0.40 - 8.00 GPH
Spray Angles 30°-90°



Type W With Protek®

Flow Rate: 0.40-2.00 GPH
Spray Angles 30°-90°



Types W

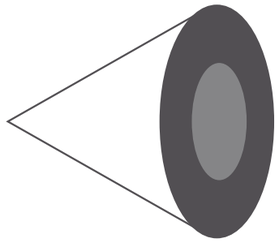
Angles and Availability						Flow Rate Gallons per Hour						
30°	45°	60°	70°	80°	90°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
■						.40		0.48	0.51	0.53	0.57	0.69
						.50	0.55	0.60	0.63	0.66	0.71	0.87
						.60	0.66	0.72	0.76	0.79	0.85	1.04
						.65	0.71	0.78	0.82	0.86	0.92	1.13
						.75	0.82	0.90	0.95	0.99	1.06	1.30
						.85	0.93	1.02	1.08	1.12	1.20	1.47
						.90	0.99	1.08	1.14	1.19	1.27	1.56
						1.00	1.10	1.20	1.26	1.32	1.41	1.73
						1.10	1.20	1.32	1.39	1.46	1.56	1.91
						1.20	1.31	1.44	1.52	1.59	1.70	2.08
						1.25	1.37	1.51	1.58	1.65	1.77	2.17
						1.35	1.48	1.63	1.71	1.79	1.91	2.34
						1.50	1.64	1.81	1.90	1.98	2.12	2.60
						1.65	1.81	1.99	2.09	2.18	2.33	2.86
						1.75	1.92	2.11	2.21	2.32	2.47	3.03
						2.00	2.19	2.41	2.53	2.65	2.83	3.46
						2.50	2.74	3.01	3.16	3.31	3.54	4.33
						2.75	3.01	3.31	3.48	3.64	3.89	4.76
						3.00	3.29	3.61	3.79	3.97	4.24	5.20
						3.25	3.56	3.91	4.11	4.30	4.60	5.63
						3.50	3.83	4.21	4.43	4.63	4.95	6.06
						4.00	4.38	4.82	5.06	5.29	5.66	6.93
						4.50	4.93	5.42	5.69	5.95	6.36	7.79
						5.00	5.48	6.02	6.32	6.61	7.07	8.66
						5.50	6.02	6.62	6.96	7.28	7.78	9.53
						6.00	6.57	7.22	7.59	7.94	8.49	10.39
						6.50	7.12	7.83	8.22	8.60	9.19	11.26
						7.00	7.67	8.43	8.85	9.26	9.90	12.12
						7.50	8.22	9.03	9.49	9.92	10.61	12.99
						8.00	8.76	9.63	10.12	10.58	11.31	13.86

□ Normally Stocked ■ Limited Inventory □ Special Order ■ Not Available

Nozzle Type W

Flow Rate	Hex 1 (Kg/Hr)
.40	1.50
.50	1.90
.55	2.15
.60	2.30
.65	2.50
.70	2.70
.75	2.90
.80	3.10
.85	3.25
.90	3.45
1.00	3.85
1.10	4.25
1.50	4.60
1.25	4.80
1.35	5.20
1.50	5.75
1.65	6.30

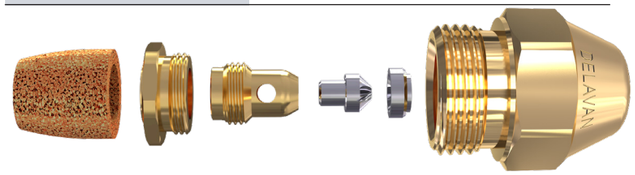
Type AR-D Nozzles



Type AR-D Nozzles are a semi-hollow cone similar to Type B but with a slightly lower concentration of the droplets in the center of the cone. They are high performance in burners of low up to medium capacity (up to flows of 2.00 GPH).

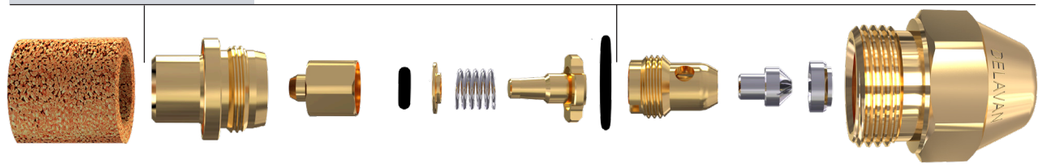
Type AR-D Standard

Flow Rate: 0.50 - 2.00 GPH
Spray Angles 45°-80°



Type AR-D With Protek®

Flow Rate: 0.50 - 2.00 GPH
Spray Angles 45°-80°



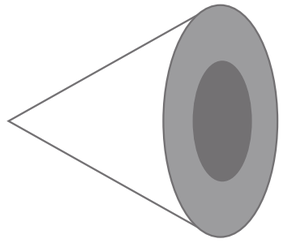
Types AR-D

Angles and Availability				Flow Rate Gallons per Hour						
45°	60°	70°	80°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
				.50	0.55	0.60	0.63	0.66	0.71	0.87
				.60	0.66	0.72	0.76	0.79	0.85	1.04
				.65	0.71	0.78	0.82	0.86	0.92	1.13
				.75	0.82	0.90	0.95	0.99	1.06	1.30
				.85	0.93	1.02	1.08	1.12	1.20	1.47
				1.00	1.10	1.20	1.26	1.32	1.41	1.73
				1.10	1.20	1.32	1.39	1.46	1.56	1.91
				1.20	1.31	1.44	1.52	1.59	1.70	2.08
				1.25	1.37	1.51	1.58	1.65	1.77	2.17
				1.35	1.48	1.63	1.71	1.79	1.91	2.34
				1.50	1.64	1.81	1.90	1.98	2.12	2.60
				1.65	1.81	1.99	2.09	2.18	2.33	2.86
				1.75	1.92	2.11	2.21	2.32	2.47	3.03
				2.00	2.19	2.41	2.53	2.65	2.83	3.46

☐ Normally Stocked ■ Limited Inventory

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

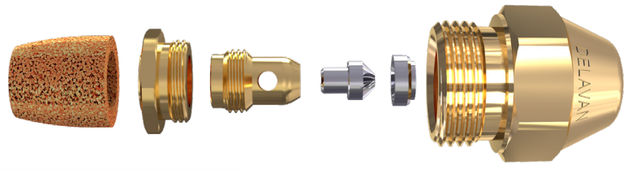
Type R-D Nozzles



Type R-D Nozzles are a semi-solid cone and have a high concentration of droplets in the center of the spray cone. They are particularly recommended for burners with a highly concentrated solid air pattern. The average droplet size is slightly coarser than on the Standard Solid Cone Type B (up to flows of 2.00 GPH).

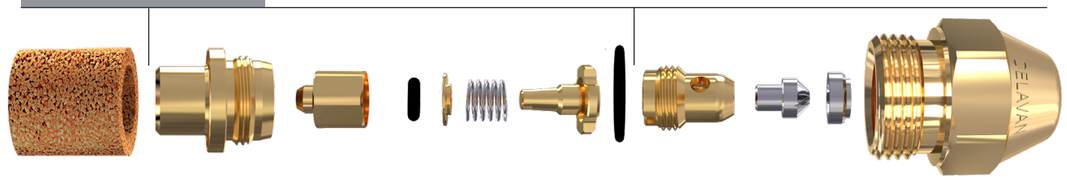
Type R-D Standard

Flow Rate: 0.50 - 2.00 GPH
Spray Angles 45°-80°



Type R-D With Protek®

Flow Rate: 0.50 - 2.00 GPH
Spray Angles 45°-80°



Types R-D

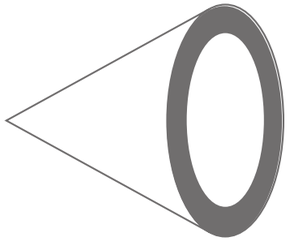
Angles and Availability				Flow Rate Gallons per Hour						
45°	60°	70°	80°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
				.50	0.55	0.60	0.63	0.66	0.71	0.87
				.60	0.66	0.72	0.76	0.79	0.85	1.04
				.65	0.71	0.78	0.82	0.86	0.92	1.13
				.75	0.82	0.90	0.95	0.99	1.06	1.30
				.85	0.93	1.02	1.08	1.12	1.20	1.47
				1.00	1.10	1.20	1.26	1.32	1.41	1.73
				1.10	1.20	1.32	1.39	1.46	1.56	1.91
				1.20	1.31	1.44	1.52	1.59	1.70	2.08
				1.25	1.37	1.51	1.58	1.65	1.77	2.17
				1.35	1.48	1.63	1.71	1.79	1.91	2.34
				1.50	1.64	1.81	1.90	1.98	2.12	2.60
				1.65	1.81	1.99	2.09	2.18	2.33	2.86
				1.75	1.92	2.11	2.21	2.32	2.47	3.03
				2.00	2.19	2.41	2.53	2.65	2.83	3.46

☐ Normally Stocked ■ Limited Inventory

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

DELAVAN® SPRAY TECHNOLOGIES

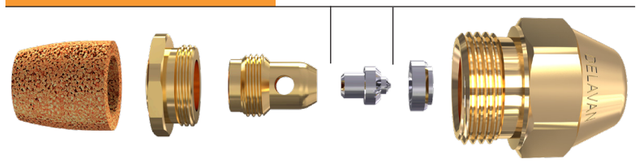
Type MH Nozzles



Type MH Mobile Home Nozzles are low-capacity nozzles designed for mobile home use. This design will minimize the usual plugging problems associated with low flow rates. The available flow rate is 0.579 GPH

Type MH Del-O-Flo™

Flow Rate: 0.50-.85 GPH
Spray Angle 80°

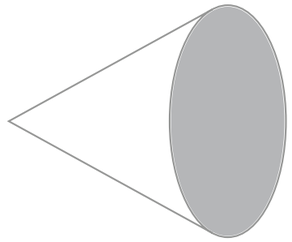


Types MH

			Flow Rate Gallons per Hour						
60°	70°	80°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
			.50	0.63	0.68	0.71	0.74	0.79	0.94

☐ Normally Stocked ■ Limited Inventory

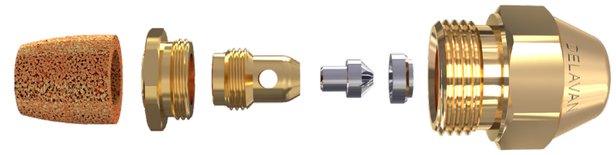
Type SS Nozzles



Semi-Solid Nozzle Type SS are semi-solid nozzles available from 0.50 to 2.00 GPH in 60°, 70°, and 80° angles.

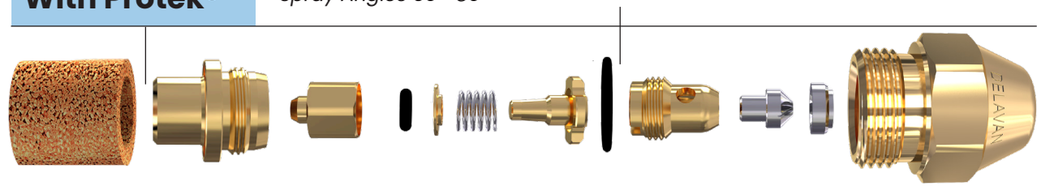
Type SS Standard

Flow Rate: 0.50 - 2.00 GPH
Spray Angle 60° - 80°



Type SS With Protek®

Flow Rate: 0.50 - 2.00 GPH
Spray Angles 60°-80°

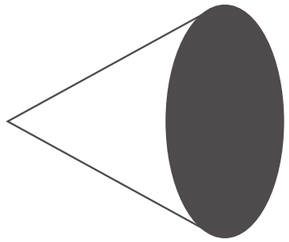


Types SS

Angles and Availability			Flow Rate Gallons per Hour						
60°	70°	80°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
			.50	0.55	0.60	0.63	0.66	0.71	0.87
			.60	0.66	0.72	0.76	0.79	0.85	1.04
			.65	0.71	0.78	0.82	0.86	0.92	1.13
			.75	0.82	0.90	0.95	0.99	1.06	1.30
			.85	0.93	1.02	1.08	1.12	1.20	1.47
			1.00	1.10	1.20	1.26	1.32	1.41	1.73
			1.10	1.20	1.32	1.39	1.46	1.56	1.91
			1.20	1.31	1.44	1.52	1.59	1.70	2.08
			1.25	1.37	1.51	1.58	1.65	1.77	2.17
			1.35	1.48	1.63	1.71	1.79	1.91	2.34
			1.50	1.64	1.81	1.90	1.98	2.12	2.60
			1.65	1.81	1.99	2.09	2.18	2.33	2.86
			1.75	1.92	2.11	2.21	2.32	2.47	3.03
			2.00	2.19	2.41	2.53	2.65	2.83	3.46

☐ Normally Stocked ■ Limited Inventory

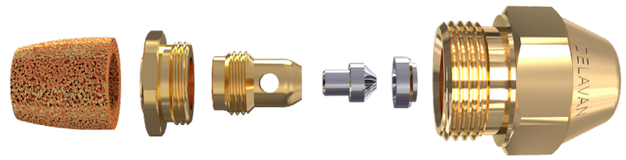
Type B Nozzles



SOLID-CONE Type B nozzles produce a spray that distributes droplets fairly uniformly throughout the complete pattern. The spray pattern becomes progressively more hollow at higher flow rates, particularly above 8.00 GPH. Provides smooth ignition and efficient combustion, particularly in larger burners.

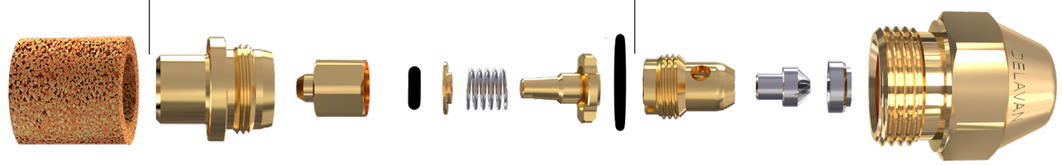
Type B Standard

Flow Rate: 0.40 - 50.00 GPH
Spray Angles 30°-90°



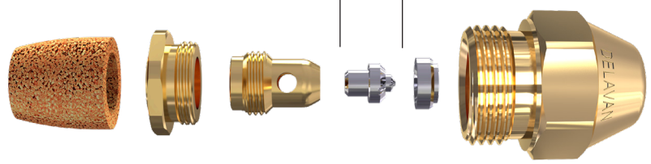
Type B With Protek®

Flow Rate: 0.40 - 2.00 GPH
Spray Angles 30°-90°



Type B With Del-O-Flo™ + Type DOF-B

Flow Rate: 0.40 - 0.85 GPH Spray Angles 30°-80°



Types B

Angles and Availability						Flow Rate Gallons per Hour						
30°	45°	60°	70°	80°	90°	GPH at 100 PSI	120 PSI	145 PSI	160 PSI	175 PSI	200 PSI	300 PSI
						.40	0.44	0.48	0.51	0.53	0.57	0.69
						.50	0.55	0.60	0.63	0.66	0.71	0.87
						.60	0.66	0.72	0.76	0.79	0.85	1.04
						.65	0.71	0.78	0.82	0.86	0.92	1.13
						.75	0.82	0.90	0.95	0.99	1.06	1.30
						.85	0.93	1.02	1.08	1.12	1.20	1.47
						.90	0.99	1.08	1.14	1.19	1.27	1.56
						1.00	1.10	1.20	1.26	1.32	1.41	1.73
						1.10	1.20	1.32	1.39	1.46	1.56	1.91
						1.20	1.31	1.44	1.52	1.59	1.70	2.08
						1.25	1.37	1.51	1.58	1.65	1.77	2.17
						1.35	1.48	1.63	1.71	1.79	1.91	2.34
						1.50	1.64	1.81	1.90	1.98	2.12	2.60
						1.65	1.81	1.99	2.09	2.18	2.33	2.86
						1.75	1.92	2.11	2.21	2.32	2.47	3.03
						2.00	2.19	2.41	2.53	2.65	2.83	3.46
						2.25	2.46	2.71	2.85	2.98	3.18	3.90
						2.50	2.74	3.01	3.16	3.31	3.54	4.33
						2.75	3.01	3.31	3.48	3.64	3.89	4.76
						3.00	3.29	3.61	3.79	3.97	4.24	5.20
						3.25	3.56	3.91	4.11	4.30	4.60	5.63
						3.50	3.83	4.21	4.43	4.63	4.95	6.06
						4.00	4.38	4.82	5.06	5.29	5.66	6.93
						4.50	4.93	5.42	5.69	5.95	6.36	7.79
						5.00	5.48	6.02	6.32	6.61	7.07	8.66
						5.50	6.02	6.62	6.96	7.28	7.78	9.53
						6.00	6.57	7.22	7.59	7.94	8.49	10.39
						6.50	7.12	7.83	8.22	8.60	9.19	11.26
						7.00	7.67	8.43	8.85	9.26	9.90	12.12
						7.50	8.22	9.03	9.49	9.92	10.61	12.99
						8.00	8.76	9.63	10.12	10.58	11.31	13.86
						8.50	9.31	10.24	10.75	11.24	12.02	14.72
						9.00	9.86	10.84	11.38	11.91	12.73	15.59
						10.00	10.95	12.04	12.65	13.23	14.14	17.32
						11.00	12.05	13.25	13.91	14.55	15.56	19.05
						12.00	13.15	14.45	15.18	15.87	16.97	20.78
						13.00	14.24	15.65	16.44	17.20	18.38	22.52
						14.00	15.34	16.86	17.71	18.52	19.80	24.25
						15.00	16.43	18.06	18.97	19.84	21.21	25.98
						16.00	17.53	19.27	20.24	21.17	22.63	27.71
						18.00	19.72	21.67	22.77	23.81	25.46	31.18
						20.00	21.91	24.08	25.30	26.46	28.28	34.64
						22.00	24.10	26.49	27.83	29.10	31.11	38.11
						24.00	26.29	28.90	30.36	31.75	33.94	41.57
						26.00	28.48	31.31	32.89	34.39	36.77	45.03
						28.00	30.67	33.72	35.42	37.04	39.60	48.50
						30.00	32.86	36.12	37.95	39.69	42.43	51.96
						32.00	35.05	38.53	40.48	42.33	45.25	55.43
						35.00	38.34	42.15	44.27	46.30	49.50	60.62
						40.00	43.82	48.17	50.60	52.92	56.57	69.28
						45.00	49.30	54.19	56.92	59.53	63.64	77.94
						50.00	54.77	60.21	63.25	66.14	70.71	86.60

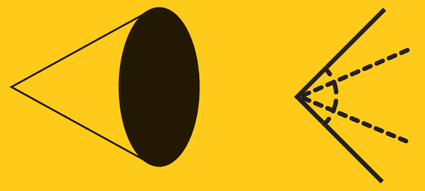
☐ Normally Stocked ☐ Limited Inventory ☐ Special Order

Nozzle Type B

Flow Rate	Hex 1 (Kg/Hr)
.40	1.50
.50	1.90
.55	2.15
.60	2.30
.65	2.50
.70	2.70
.75	2.90
.80	3.10
.85	3.25
.90	3.45
1.00	3.85
1.10	4.25
1.50	4.60
1.25	4.80
1.35	5.20
1.50	5.75
1.65	6.30

Specialty Nozzles

SNA™ Nozzle

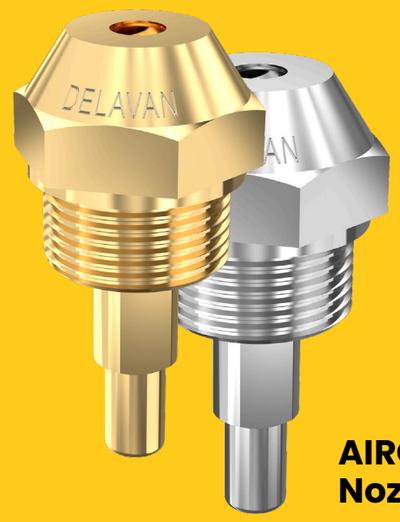


Spray Pattern:
Air Atomizing nozzle for extremely fine spray particle size at low air pressures

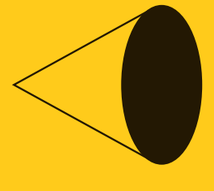
Spray Angle:
varies with air pressure
70°-90°

- *Produces a solid cone spray with extremely fine particle size at low air pressures and low CFM*
- *Flow rates, spray angles, and droplet sizes can be modified, with limitations, by variations in air, lift, etc*
- *Clog-free operation of low volume due to large inside passages*

Fuel Flow Rate: .20-1.00 GPH at 3-5 PSI air pressure using lift height of 1-7”
Air Volume: .36-102 CFM
Thread: 9/16-24 UNEF
Hex: 5/8”
Material: Brass and 416 Stainless



AIRO™ Nozzle

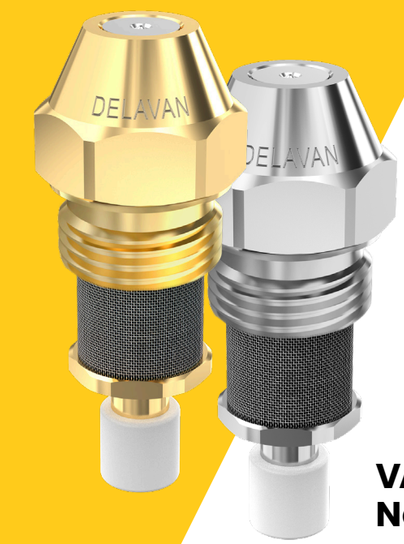


Spray Pattern:
Air Atomizing Nozzle with a uniform solid cone, spray angle varies with air pressures

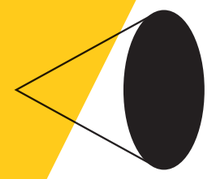
Spray Angles:
varies with air pressure
60°-90°

- *For good atomization of both light and heavy oils at higher flow rates*

Flow Rate: 10.0 to 200 GPH
Thread Size: 3/4”-20 UNEF & 15/16”-20 UNEF
Hex Size: 7/8” and 1 1/4”
Adapter Air Inlet: 1/4-1/2 NPT
Adapter Liquid Inlet: 1/8-1/4 NPT
Air Pressure: 20-150 PSI
Material: Brass, Stainless Steel, Inconel, and Hastelloy



VARIFLO™ Nozzle



Spray Pattern:
Bypassing nozzle with variable flow rate

Spray Angles:
30°-90°

- *Permits variable burner outputs based on bypass pressure*
- *Wider spray angles at lower flow rates*
- *Less subject to clogging*

Flow Rate @100 PSI #2: 0.75-50.00 GPH
Thread Size: 9/16-24 UNEF
Hex Size: 5/8”
Material: Brass and 416 Stainless
Teflon Seal

The Variflo nozzle is a pressure atomizing nozzle which provides discharge rate variations without changing nozzles using the bypass principle.

With constant inlet supply pressure and the bypass (return line) closed, the nozzle operates as a complex atomizing nozzle. For a reduced discharge flow, the bypass line is opened and part of the fuel is allowed to return to the tank. The advantage is reduced flow without deterioration of the spray quality.

The maximum to minimum discharge flow rate at constant supply pressure is referred to as the “turndown ratio.” The standard catalog nozzles have turndown ratios of approximately 5 to 1.

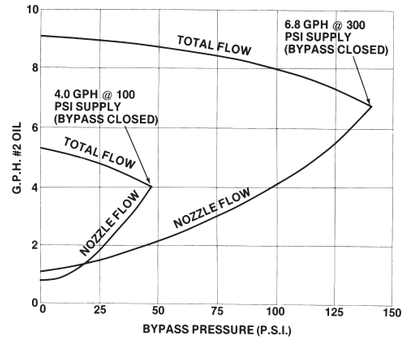
Variflo™ Pressure Atomizing Nozzles

Spray Characteristics

- Good atomization over a wider flow range
- Wider spray angles at lower flow rates
- Less subject to clogging
- Less buildup of carbon and gum residue

The Key Advantage of the Variflo Nozzle

The key advantage of the Variflo Nozzle over a simplex oil burner nozzle is flexibility; large turndown ratios with better atomization. With the Variflo Nozzle using a constant supply pressure, the discharge flow rate varies approximately as the square of the bypass pressure. This means that at minimum flow, the atomization pressure is reduced approximately 34%. With the simplex nozzle, the discharge flow rate varies as the square root of the supply pressure. This means that to obtain 1/2 of the design flow rate, the supply pressure must be reduced by 1/4 of the original pressure. This pressure is too low for good atomization.



TYPICAL CURVE @ 100 & 300 PSI SUPPLY
(5 to 1 turn down — ⅝" hex size)

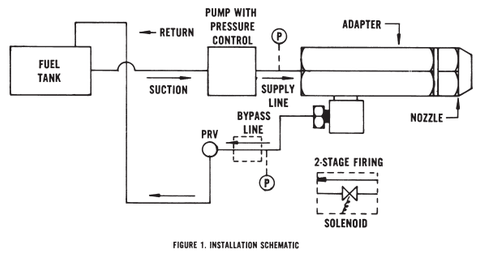
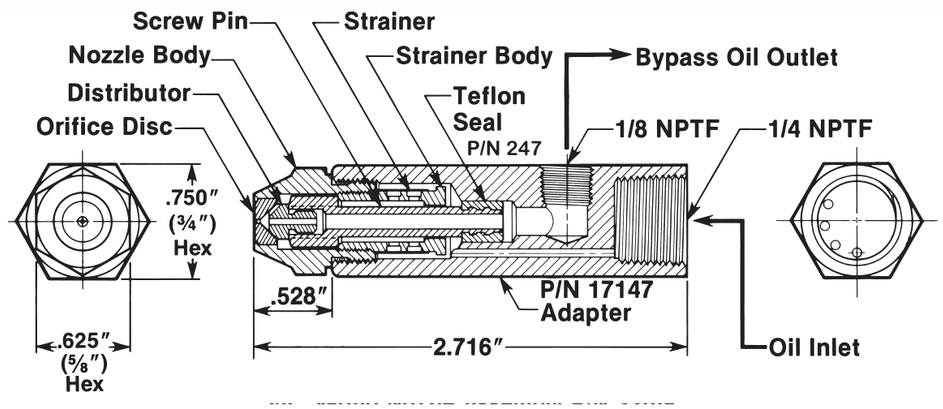


FIGURE 1. INSTALLATION SCHEMATIC



Variflo Nozzle Capacity Chart

Dash No.	Spray Angle	Bypass Closed	100 PSI Supply		300 PSI Supply
			Bypass Open		Bypass Closed
		Calibrated Nozzle Flow-GPH	Total Flow-GPH (Ref.)	Nozzle Flow-GPH (ref.)	Nozzle Flow -GPH (Ref.)
-001 -002	45° 60°	.75	1.02	.20	1.27
-003 -004	45° 60°	1.00	1.30	.22	1.60
-005 -006 -007	45° 60° 80°	1.50	1.90	.30	2.30
-008 -009 -010	45° 60° 80°	2.00	2.60	.38	3.30
-011 -012 -013	45° 60° 80°	2.50	3.40	.49	4.00
-014 -015 -016 -017	30° 45° 60° 80°	3.00	4.00	.57	5.00
-018 -019 -020 -021	30° 45° 60° 80°	3.50	4.60	.67	6.00
-022 -023 -024 -025	30° 45° 60° 80°	4.00	5.20	.78	6.80
-026 -027 -028 -029	30° 45° 60° 80°	4.50	6.00	.85	7.50
-030 -031 -032 -033	30° 45° 60° 80°	5.00	6.6	.97	8.60
-034 -035 -036 -037	30° 45° 60° 80°	5.50	7.40	1.02	9.10
-038 -039 -040 -041	30° 45° 60° 80°	6.00	8.00	1.17	9.90

*** "We offer nozzles flow rate in multiple platforms of different liquid fuels."**

NOTE: 30° and 90° nozzles listed above, as well as other flow rates and spray angles not listed, are available on special order only.

Nozzles are calibrated for flow and spray angle at 100 PSI on #2 oil. Spray angles at 300 PSI will be somewhat narrower than spray angle at 100 PSI. As bypass is opened, spray angle will increase (up to 15° wider) both at 100 PSI and 300 PSI supply.

Ordering Instructions: Include both part number and description. Specify P/N 33769 - see nozzle capacity chart for dash number corresponding to flow and spray angle desired. Order adapter separately (specify P/N 17147).

Variflo Nozzle Capacity Chart

Dash No.	Spray Angle	Bypass Closed	100 PSI Supply		300 PSI Supply
			Bypass Open		Bypass Closed
		Calibrated Nozzle Flow-GPH	Total Flow-GPH (Ref.)	Nozzle Flow-GPH (Ref.)	Nozzle Flow -GPH (Ref.)
-042 -043 -044 -045	30° 45° 60° 80°	6.50	8.50	1.25	10.75
-046 -047 -048 -049	30° 45° 60° 80°	7.00	8.90	1.35	11.80
-050 -051 -052 -053	30° 45° 60° 80°	7.50	9.90	1.41	12.50
-054 -055 -056 -057	30° 45° 60° 80°	8.00	10.60	1.56	13.5
-058 -059 -060 -061	30° 45° 60° 80°	9.00	11.50	1.72	15.00
-062 -063 -064 -065	30° 45° 60° 80°	9.50	12.80	1.78	15.90
-066 -067 -068 -069	30° 45° 60° 80°	10.00	13.40	1.92	16.70
-070 -071 -072 -073	30° 45° 60° 80°	12.00	15.90	2.26	20.80
-074 -075 -076 -077	30° 45° 60° 80°	14.00	19.00	2.75	23.50
-078 -079 -080	45° 60° 80°	16.00	21.00	3.10	27.00
-081 -082 -083	45° 60° 80°	18.00	24.00	3.40	31.20
-084 -085 -086	45° 60° 80°	20.00	26.50	3.70	33.80
-087 -088 -089	45° 60° 80°	22.00	28.70	4.10	36.80
-090 -091 -092	45° 60° 80°	24.00	31.50	4.65	41.00
-093 -094 -095	60° 80° 90°	28.00	36.00	5.22	48.50
-096 -097 -098	60° 80° 90°	30.00	38.50	5.80	51.50
-099 -100 -101	60° 80° 90°	35.00	46.40	6.70	59.60
-102 -103	60° 80°	40.00	50.00	10.70	68.00
-104 -105	60° 80°	45.00	58.00	9.70	75.50
-106 -107	60° 80°	50.00	62.00	13.90	84.50

Dimensions and Adapter Information

Dimensions and Adapter Information

Nozzle Body Size	Dimensions (Inches)			Adapter P/N	Adapter Threads Npt		Seal P/N
	Overall Length	Adapter Hex	Seal Surface to Nozzle Face	(Includes Seal)	Return Port	Supply Inlet	(Teflon)
5/8" Hex	2.72	0.75	0.528	17147 Brass	1/8	1/4	247
13/16" Hex	2.81	0.813	0.620	30298 Brass	1/8	1/4	337
1-1/4" Hex	3.67	1.25	0.800	31437 Mild Steel	1/4	3/8	1733

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

13/16" Variflo Nozzle Assembly

P/N 30630 Standard brass body with stainless steel metering set, 4 to 1 turndown ratio.
P/N 30631 Brass body with hardened stainless steel metering set, 4 to 1 turndown ratio.

13/16" Variflo Nozzle Assembly

Max Capacity in GPH			Standard Spray Angle at Maximum Flows (widens slightly at lower flows)					
@150 PSI Inlet Pressure Using #2 Fuel Oil	@300 PSI Inlet Pressure Using #2 Fuel Oil Rated Flow	@300 PSI Using #5 Fuel Oil Preheated to 100 SSU	30°	45°	60°	70°	80°	90°
14.2	20		-1	-2	-3	-4	-5	-6
17.7	25		-7	-8	-9	-10	-11	-12
21.2	30		-13	-14	-15	-16	-17	-18
	35			-19	-20	-21	-22	-23
	37.5			-51	-52	-53	-54	-55
	40			-24	-25	-26	-27	-28
Recommended 300 PSI Next Column	45	Approx same as for #2 fuel oil		-29	-30	-31	-32	-33
	50			-34	-35	-36	-37	-38
	55				-56	-57	-58	-59
	60				-39	-40	-41	-42
	65				-60	-61	-62	-63
	70				-43	-44	-45	-46
	80				-47	-48	-49	-50

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

1-1/4" Variflo Nozzle Assembly

P/N 30637 Standard stainless steel, 4 to 1 turndown ratio.
P/N 30649 All stainless steel with threaded screw pin, 4 to 1 turndown ratio.
P/N 30689 All stainless steel with hardened metering set, 4 to 1 turndown ratio.

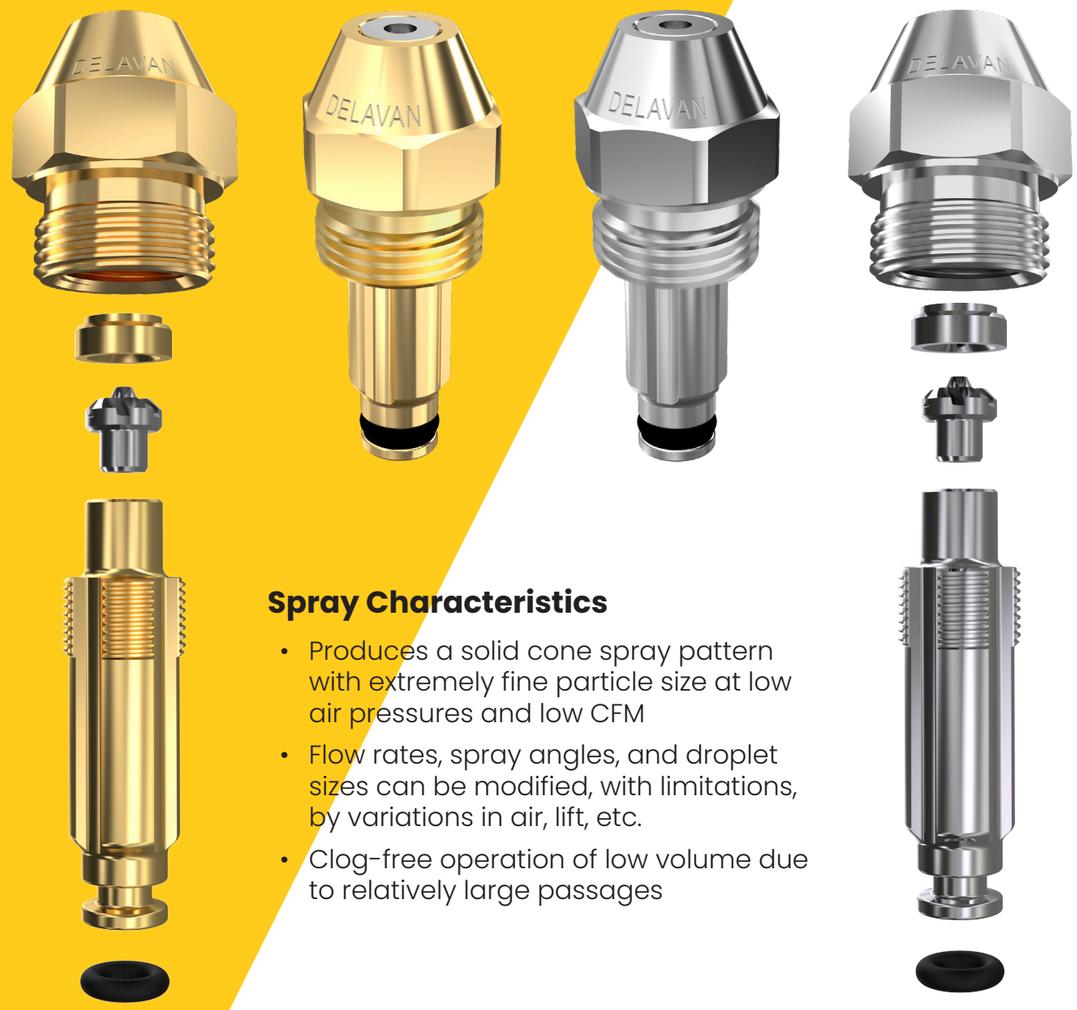
1-1/4" Variflo Nozzle Assembly

@150 PSI Inlet Pressure Using #2 Fuel Oil	@300 PSI Inlet Pressure Using #2 Fuel Oil Rated Flow	@300 PSI Using #5 Fuel Oil Preheated to 100 SSU	Standard Spray Angle at Maximum Flows (widens slightly at lower flows)			
			60°	70°	80°	90°
Recommended 300 PSI Next Column	80	Approx Same as for #2 Fuel Oil	-1	-2	-3	-4
	90		-5	-6	-7	-8
	100		-9	-10	-11	-12
	125		-13	-14	-15	-16
	150		-17	-18	-19	-20
	165					-21

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

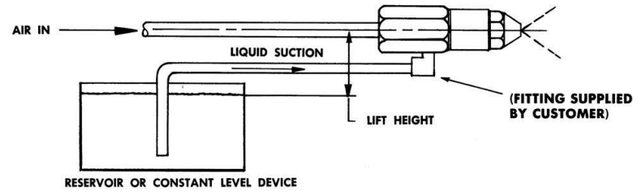
DELAVAN® SPRAY TECHNOLOGIES

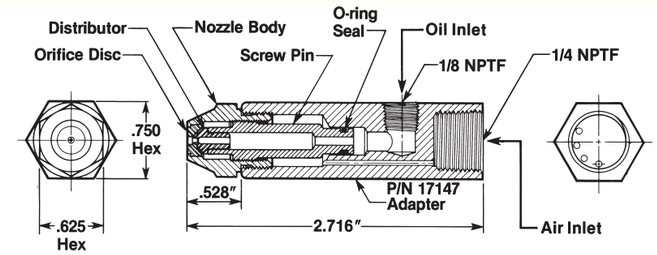
SNA™ Siphon Type Air Atomizing Nozzles



Spray Characteristics

- Produces a solid cone spray pattern with extremely fine particle size at low air pressures and low CFM
- Flow rates, spray angles, and droplet sizes can be modified, with limitations, by variations in air, lift, etc.
- Clog-free operation of low volume due to relatively large passages





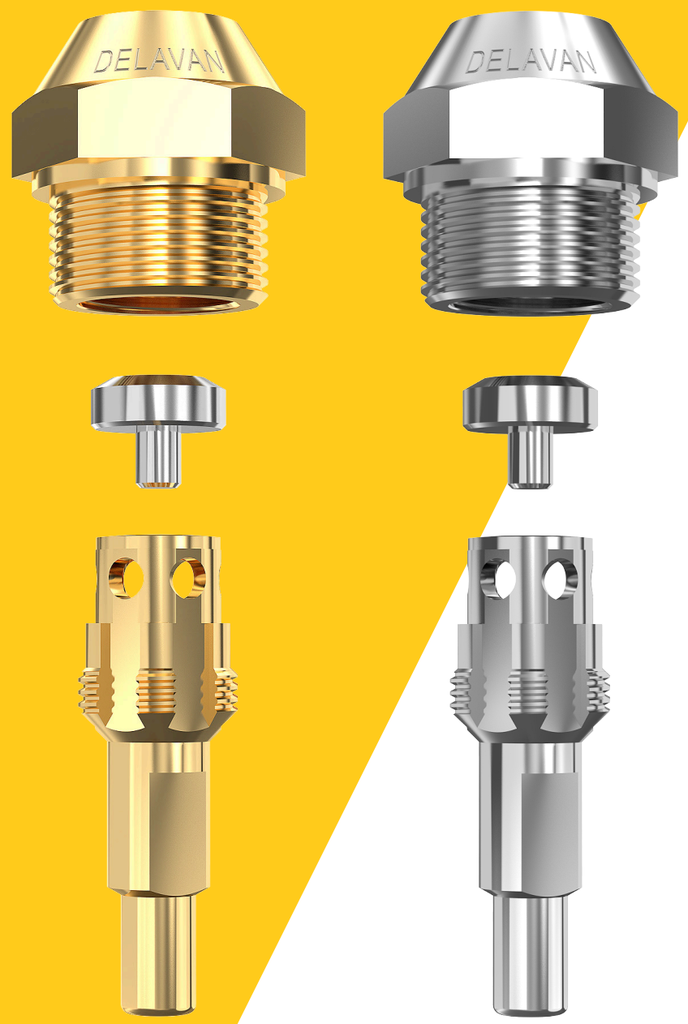
Ordering Instructions: Include both part number and description. Specify P/N 30609 - see nozzle capacity chart for dash number corresponding to flow desires. Order adapter separately (specify P/N 17147).

Siphon Nozzle Capacity Chart

Part Number	Nozzle No.	3 PSIG Air Fuel (GPH) Air (CFM)		4 PSIG Air Fuel (GPH) Air (CFM)		5 PSIG Air Fuel (GPH) Air (CFM)		Lift Height (Inches)
30609-002 30610-001	SNA .20	.19 .16 .14	.36 .36 .36	.23 .20 .17	.45 .45 .45	.25 .22 .20	.49 .49 .49	1 4 7
30609-003 30610-002	SNA .30	.29 .26 .23	.41 .41 .41	.33 .30 .27	.49 .49 .49	.36 .33 .30	.55 .55 .55	1 4 7
30609-004 30610-003	SNA .40	.38 .34 .30	.45 .45 .45	.44 .40 .36	.54 .54 .54	.49 .45 .41	.61 .61 .61	1 4 7
30609-005 30610-004	SNA .50	.48 .43 .38	.50 .50 .50	.54 .50 .46	.59 .59 .59	.58 .53 .48	.65 .65 .65	1 4 7
30609-007 30610-005	SNA .65	.63 .57 .51	.59 .59 .59	.72 .65 .58	.67 .67 .67	.78 .72 .66	.76 .76 .76	1 4 7
30609-008 30610-006	SNA .75	.75 .65 .59	.63 .63 .63	.83 .75 .67	.74 .74 .74	.93 .84 .75	.87 .87 .87	1 4 7
30609-009 30610-007	SNA .85	.87 .75 .66	.71 .71 .71	.93 .85 .77	.80 .80 .80	1.04 .95 .86	.93 .93 .93	1 4 7
30609-011 30610-008	SNA 1.00	.96 .84 .72	.73 .73 .73	1.10 1.00 .90	.91 .91 .91	1.15 1.06 .97	1.02 1.02 1.02	1 4 7

***30609 - Brass** Adapter for Brass: 17147
***30610 - SST** Adapter for Stainless Steel: 29713-002
*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

AIRO™
Air Atomizing Nozzles



The Industrial AIRO nozzle is an air atomizing nozzle designed for #2, #3, and preheated #5 and #6 fuels. It uses low-pressure air for atomization, effectively handling fuels too viscous for pressure atomizing nozzles and providing finer breakup with sufficient air.

As an internal mixing nozzle, air and fuel are piped separately and mixed just before entering the atomizing slots. The air mixes thoroughly with the fuel in the swirl chamber, resulting in a uniform spray with a solid cone pattern.

Although air atomizing nozzles are more expensive and have higher power requirements due to the compressor, these disadvantages are offset by their superior ability to handle heavy fuels.

Applications

- May be used as a fixed discharge nozzle
- May be arranged for two-stage firing if desired
- May be arranged for complete modulating over desired flow range
- Handles light fuels at any flow rate from 2 GPH and up. The proper nozzle must be selected for each range
- Handles #5 or #6 oil preheated to approximately 100 SSU. Above 20 GPH, higher viscosities may be handled if sufficient air is available

Spray Characteristics

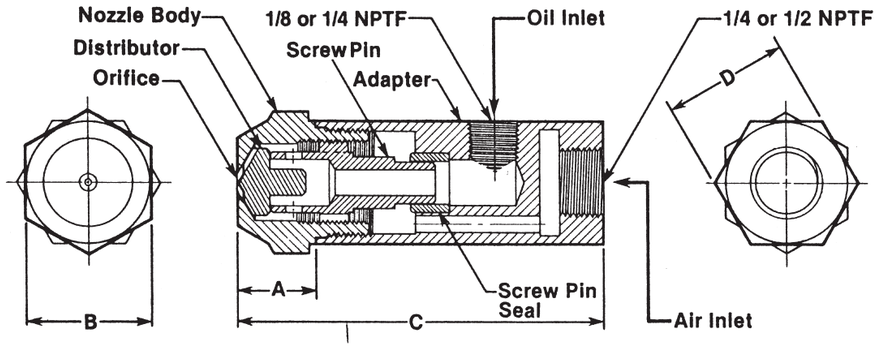
- Uniform solid cone
- Angle varies with air pressure and flow (higher air pressure produces narrower spray angle). Constant spray angle may be obtained by modulating air pressure with fluid flow.
- Separate metering device, such as an orifice, metering pump, or valve is required
- Large flow passages greatly reduce clogging
- With the internal mixing type of nozzle, the spray angle changes with the fuel-air ratio (pounds of fuel per pound of atomizing air). The spray angle is wider at high fuel-air ratio
- Droplet size is smaller at higher air pressures and narrower spray angles

AIRO™

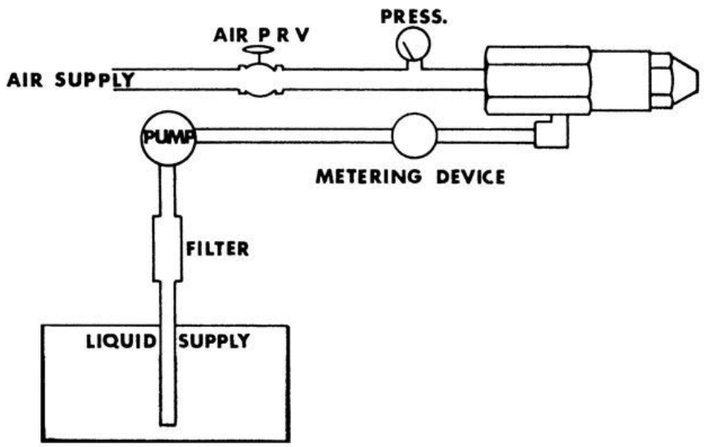
Construction and Materials

The AIRO is made up of three basic parts, available in the following materials. (Contact factory for other material requirements.)

1. Nozzle Body — Brass or stainless steel. Thread sizes: 3/4" - 20 UNEF on #30615 and 1-1/8" - 18 UNEF on #30616.
2. Distributor — Brass, stainless steel, or tungsten carbide (requires special body with replaceable tungsten carbide orifice disc, integral with body).
3. Screw pin — Brass or stainless steel.



Airo Nozzle Assembly
P/N 30615 (.875" Hex) & P/N 30616 (1.250" Hex)



Ordering Instructions

Include both part number and description. To find part number and dash number, see the nozzle capacity charts. First, locate the correct nozzle size and capacity, then select proper body material and screw pin type. Please specify distributor material if different than screw pin material. Order adapter separately (specify part number and description).

Adapters and Seals

Hex Size	Part Number	Material
7/8	23034-001 23034-002 337	Brass Stainless Steel Teflon Seal
1 1/4	30678-001 30678-002 30678-003 9113	Mild Steel Stainless Steel Inconel Teflon Seal

Note: Threaded screw pins require different seals. Contact customer service or your sales representative for more information.

Dimensions and Weights for Airo Nozzles

Nozzle Type	Material	Dimensions (Inches)				Inlet Sizes		Weight (Ounces)
		A	B	C	D	Air	Liquid	
30615-000 with 23034-001 Adapter	Brass	.625	.875 Hex	3.125	.875 Hex	1/4 NPT	1/8 NPT	7
30615-000 with 23034-002 Adapter	Stainless Steel	625	.875 Hex	3.125	.875 Hex	1/4 NPT	1/8 NPT	8
30616-001 with 30678-000 Adapter	Stainless Steel	.800	1.25 Hex	3.620	1.25 Hex	1/2 NPT	1/4 NPT	9

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

1 1/4" Airo Nozzle Capacities

Part Number	Customer or Old Catalog PN	Flow Rate (GPH)	Body Material	Screw Pin Type and Material	Air Press (PSI)	Air Flow @ Max Disch (PPH)	Spray Angle (°)
30616-001	9078-60	60	SS	SS	30.0	14.5-16.0	70°
30616-004	9078-70	70	SS	SS	30.0	16.0-17.5	70°
30616-005	12581-70	70	SS	Thd'd, SS	30.0	16.0-17.5	70°
30616-008	9078-80	80	SS	SS	30.0	17.0-18.5	70°
30616-009	12581-80	80	SS	Thd'd, SS	30.0	17.0-18.5	70°
30616-011	15293-80	80	HSS	HSS	30.0	17.0-18.5	70°
30616-012	27932	80	SS	SS	30.0	20.0-22.0	75-85°
30616-014	9078-100	100	SS	SS	30.0	21.0-22.5	70°
30616-015	12581-100	100	SS	Thd'd, SS	30.0	21.0-22.5	70°
30616-017	15293-100	100	HSS	HSS	30.0	21.0-22.5	70°
30616-019	17022	100	Incon	Incon	30.0	21.0-22.5	70°
30616-020	9078-120	120	SS	SS	30.0	23.5-25.0	70°
30616-021	12581-120	120	SS	Thd'd, SS	30.0	23.5-25.0	70°
30616-024	9078-130	130	SS	SS	30.0	25.0-26.5	70°
30616-025	12581-130	130	SS	Thd'd, SS	30.0	25.0-26.5	70°
30616-027	15293-150	130	HSS	HSS	35.0	25.0-26.5	70°
30616-029	9078-150	150	SS	SS	30.0	26.0-27.5	70°
30616-030	12581-150	150	SS	Thd'd, SS	30.0	26.0-27.5	70°
30616-032	15293-150	150	HSS	HSS	30.0	23.0-24.5	70°
30616-033	19279	150	Incon	Thd'd, Incon	30.0	26.0-27.5	70°
30616-034	19810	150	Incon	Incon	30.0	26.0-27.5	70°
30616-035	9078-200	150	SS	SS	20.0	25.0-26.5	70°
30616-036	12581-200	150	SS	Thd'd, SS	20.0	25.0-26.5	70°
30616-039	14788	150	SS	SS	25.0	23.0-25.0	65°

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

AIRO™

Ordering Instructions

Include both, part number and description. To find part number and dash number, see the nozzle capacity charts. First, locate the correct nozzle size and capacity, then select proper body material and screw pin type. Please specify distributor material if different than screw pin material. Order adapter separately (specify part number and description).

7/8" Airo Nozzle Capacities

Part Number	Flow Rate (GPH)	Body Material	Screw Pin Material	Air Pressure (PSI)	Air Flow @ Max PPH	Spray Angle Degrees
30615-001	10	Brass	Unthreaded Brass	20	4.6 - 4.9	70 - 80
30615-002	10	303 SST	Unthreaded 303 SST	20	4.6 - 4.9	70 - 80
30615-003	10	HT 303 SST	Unthreaded 303	20	4.6 - 4.9	70 - 80
30615-004	10	303 SST	Unthreaded Brass	20	4.6 - 4.9	70 - 80
30615-005	10	303 SST	Threaded Brass	20	4.6 - 4.9	70 - 80
30615-006	10	Brass	Threaded Brass	20	4.6 - 4.9	70 - 80
30615-007	10	303 SST	Threaded 303 SST	20	4.6 - 4.9	70 - 80
30615-009	10	Inconel	Threaded AMS 5665	20	4.6 - 5	60 - 70
30615-010	15	Brass	Unthreaded Brass	20	4.6 - 5	70 - 80
30615-011	15	303 SST	Unthreaded 303 SST	20	4.6 - 5	70 - 80
30615-012	15	HT 303 SST	Unthreaded 303 SST	20	4.6 - 5	70 - 80
30615-013	15	303 SST	Unthreaded Brass	20	4.6 - 5	70 - 80
30615-014	15	303 SST	Threaded Brass	20	4.6 - 5	70 - 80
30615-015	20	Brass	Unthreaded Brass	20	6 - 6.3	70 - 80
30615-016	20	303 SST	Unthreaded 303	20	6 - 6.3	70 - 80
30615-017	20	HT 303 SST	Unthreaded 303 SST	20	6 - 6.3	70 - 80
30615-018	20	303 SST	Unthreaded Brass	20	6 - 6.3	70 - 80
30615-019	20	303 SST	Threaded Brass	20	6 - 6.3	70 - 80
30615-020	20	Brass	Threaded Brass	20	6 - 6.3	70 - 80
30615-021	20	303 SST	Threaded 303 SST	20	6 - 6.3	70 - 80
30615-023	25	Brass	Unthreaded Brass	25	6.1 - 6.4	70 - 80
30615-024	25	303 SST	Unthreaded 303 SST	25	6.1 - 6.4	70 - 80
30615-025	25	HT 303 SST	Unthreaded 303 SST	25	6.1 - 6.4	70 - 80
30615-026	25	303 SST	Unthreaded Brass	25	6.1 - 6.4	70 - 80
30615-027	25	303 SST	Threaded 303 SST	25	6.1 - 6.4	70 - 80
30615-028	30	Brass	Unthreaded Brass	25	6.8 - 7.1	70 - 80
30615-029	30	303 SST	Unthreaded 303	25	6.8 - 7.1	70 - 80
30615-030	30	HT 303 SST	Unthreaded 303 SST	25	6.8 - 7.1	70 - 80
30615-031	30	303 SST	Unthreaded Brass	25	6.8 - 7.1	70 - 80
30615-032	30	303 SST	Threaded Brass	25	6.8 - 7.1	70 - 80
30615-033	30	Brass	Threaded Brass	25	6.8 - 7.1	70 - 80
30615-034	30	303 SST	Threaded 303 SST	25	6.8 - 7.1	70 - 80
30615-036	30	303 SST	Unthreaded Brass	30	9.5 - 10.5	70 - 80
30615-037	30	303 SST	Unthreaded Brass	30	10.2 - 11	70 - 80
30615-038	35	Brass	Unthreaded Brass	25	8 - 8.4	70 - 80

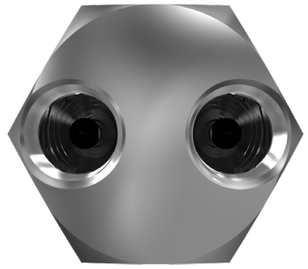
*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

7/8" Airo Nozzle Capacities

Part Number	Flow Rate (GPH)	Body Material	Screw Pin Material	Air Pressure (PSI)	Air Flow @ Max PPH	Spray Angle Degrees
30615-040	35	HT 303 SST	Unthreaded 303 SST	25	8 - 8.4	70 - 80
30615-041	35	303 SST	Threaded Brass	25	8 - 8.4	70 - 80
30615-042	35	303 SST	Threaded Brass	25	8 - 8.4	70 - 80
30615-043	35	Brass	Unthreaded Brass	30	16 - 18	70 - 80
30615-044	40	Brass	Unthreaded Brass	30	8.5 - 8.9	70 - 80
30615-045	40	303 SST	Unthreaded 303	30	8.5 - 8.9	70 - 80
30615-047	40	Brass	Threaded Brass	30	8.5 - 8.9	70 - 80
30615-048	40	303 SST	Threaded 303 SST	30	8.5 - 8.9	70 - 80
30615-050	40	303 SST	Unthreaded Brass	30	8.5 - 8.9	70 - 80
30615-051	40	303 SST	Threaded Brass	30	8.5 - 8.9	70 - 80
30615-052	40	303 SST	Unthreaded Brass	30	13.5 - 14.5	60 - 70
30615-053	40	Inconel	Threaded AMS 5665	30	8.5 - 9.7	60 - 70
30615-054	40	303 SST	Unthreaded Brass	30	10 - 11	70 - 80
30615-055	50	Brass	Unthreaded Brass	30	9.5 - 10.5	65 - 75
30615-056	50	303 SST	Unthreaded 303	30	9.5 - 10.5	65 - 75
30615-057	50	HT 303 SST	Unthreaded 303 SST	30	9.5 - 10.5	65 - 75
30615-058	50	303 SST	Unthreaded Brass	30	9.5 - 10.5	65 - 75
30615-059	50	303 SST	Threaded Brass	30	9.5 - 10.5	65 - 75
30615-060	50	303 SST	Threaded 303 SST	30	9.5 - 10.5	60 - 70
30615-062	50	303 SST	Unthreaded Brass	30	9.5 - 10.5	70
30615-063	50	Inconel	Unthreaded AMS	30	9.5 - 10.5	60 - 70
30615-064	50	Brass	Unthreaded Brass	30	17 - 18.5	80
30615-069	20	303 SST	Unthreaded 303 SST	20	6 - 6.3	70 - 80
30615-071	25	303 SST	Unthreaded 303	25	6.1 - 6.4	70 - 80
30615-073	30	303 SST	Unthreaded 303 SST	25	6.8 - 7.1	70 - 80
30615-075	35	303 SST	Unthreaded 303 SST	25	8 - 8.4	70 - 80
30615-077	40	303 SST	Unthreaded 303	30	8.5 - 8.9	70 - 80
30615-079	40	316 SST	Threaded 316 SST	30	8.5 - 8.9	70 - 80
30615-081	30	303 SST	Unthreaded Brass	30	10.2 - 11	70 - 80
30615-082	30	303 SST	Threaded 303 SST	30	10.2 - 11	70 - 80
30615-083	10	HT 303 SST	Unthreaded 303 SST	20	4.6 - 4.9	70 - 80
30615-084	30	303 SST	Unthreaded 303 SST	30	10.2 - 11	70 - 80
30615-085	40	303 SST	Unthreaded 303	30	13.5 - 14.5	60 - 70
30615-086	100	Brass	Unthreaded Brass	35	20 - 22	
30615-087	120	Brass	Unthreaded Brass	35	19 - 21	
30615-088	150	Brass	Unthreaded Brass	35	16 - 18	
30615-098	35	303 SST	Unthreaded 303 SST	30	16 - 18	80
30615-099	15	303 SST	Threaded 303 SST	20	4.6 - 5	70 - 80
30615-100	10	Brass	Unthreaded Brass	20	6.6 - 7	70 - 80
30615-101	50	303 SST	Unthreaded 303 SST	30	17 - 18.5	80
30615-102	120	303 SST	Unthreaded 303 SST	35	19 - 21	
30615-103	150	303 SST	Unthreaded 303	35	16 - 18	
30615-104	100	303 SST	Unthreaded 303 SST	35	20 - 22	
30615-105	20	Inconel	Threaded AMS 5665	20	6 - 6.3	70 - 80
30615-106	40	Inconel	Threaded AMS 5665	30	89.7 - 10.8	70 - 80
30615-107	10	303 SST	Unthreaded 303 SST	20	4.6 - 4.9	70 - 80

*** We offer nozzles flow rate in multiple platforms of different liquid fuels.**

Swirl-Air™ Combustion Air Atomizing Nozzles



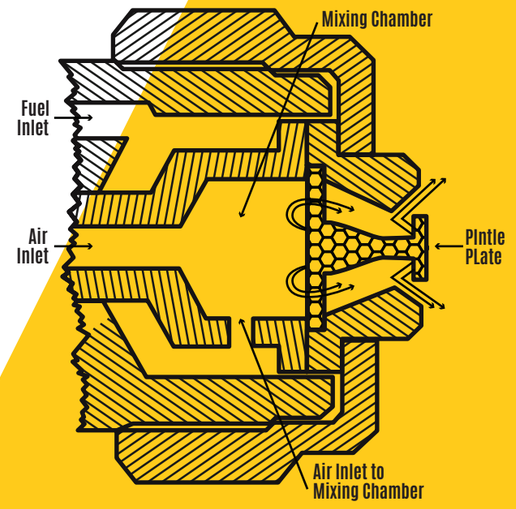
Spray Characteristics

Air, steam, or a process gas is introduced tangentially into the nozzle chamber in the low pressure region of the swirling mixture, creating extreme turbulence and primary atomization. As the fuel leaves the orifice, it impinges against the deflector ring which serves a dual purpose: close control of spray angle and breakup of the spray into even finer droplets (secondary atomization). Upon leaving the nozzle, the mixture swirls in a clockwise direction, looking downstream.

The nozzle can achieve mean droplet diameters in the 50 to 100 micron range at modest air pressures and air volumes (SCFM). When using steam instead of air, the steam pressure should be approximately four times greater to achieve the same spray characteristics. The degree of atomization is also variable by controlling the ratio of air to fuel flows.

Swirl-Air™ Combustion Air Atomizing Nozzles

In combustion applications, Delavan's two-fluid Swirl-Air can produce fine atomization at flow rates up to 300 gph. Fuel enters the mixing chamber axially coming in contact with tangentially introduced streams of air (or steam). Interaction of the two creates extreme turbulence and mixing. Finally, the fuel-air mixture impinges against a circular deflector ring, or pintle plate, before leaving the nozzle as a finely atomized spray. The progressive application of shear and inertial forces in the nozzle helps to provide high efficiencies.



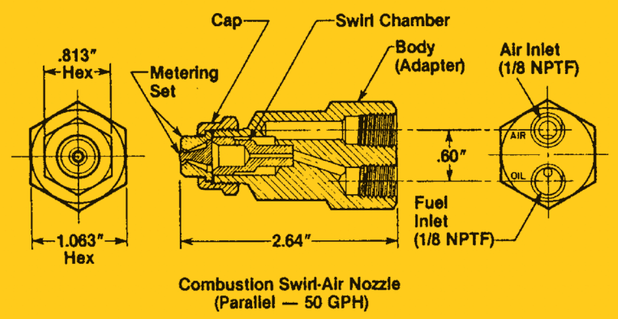
Swirl-Air Advantages

- Large fuel passages and lack of torturous paths reduce chances for clogging.
- Air consumption (SCFM) and power requirements are relatively low, permitting the use of smaller, more economical air compressors and blowers.
- Good atomization ratios.
- Can handle fuels up to Type C Bunker oil and combustible waste liquids.
- Various spray angles and capacities are available through a selection of metering sets and swirl chambers.
- No external struts that interfere with the spray.

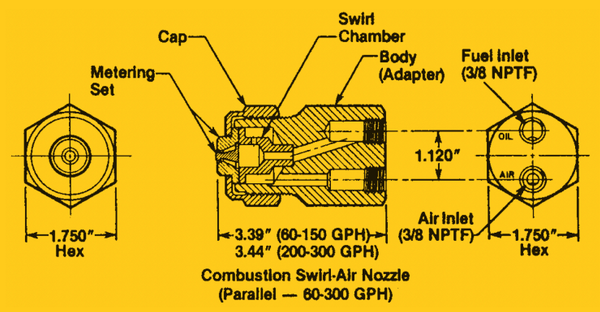
Applications

- As igniter nozzles in both coal-fired and oil-fired electric power stations.
- As main atomizers in large burners, especially where heavier fuels are used.
- As an incineration atomizer for products such as wastewater, mustard gas, chemical waste, eggs, etc.

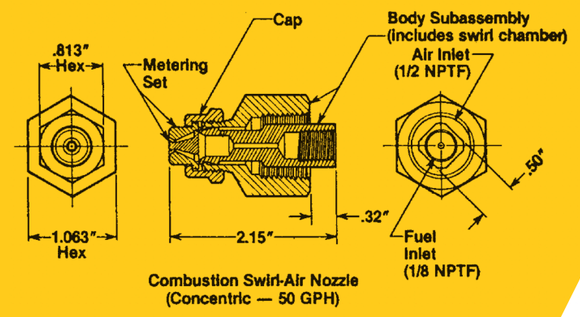
Swirl-Air™



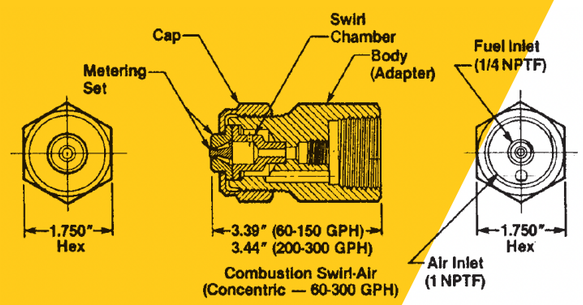
Combustion Swirl-Air Nozzle
(Parallel — 50 GPH)



Combustion Swirl-Air Nozzle
(Parallel — 60-300 GPH)



Combustion Swirl-Air Nozzle
(Concentric — 50 GPH)



Combustion Swirl-Air
(Concentric — 60-300 GPH)

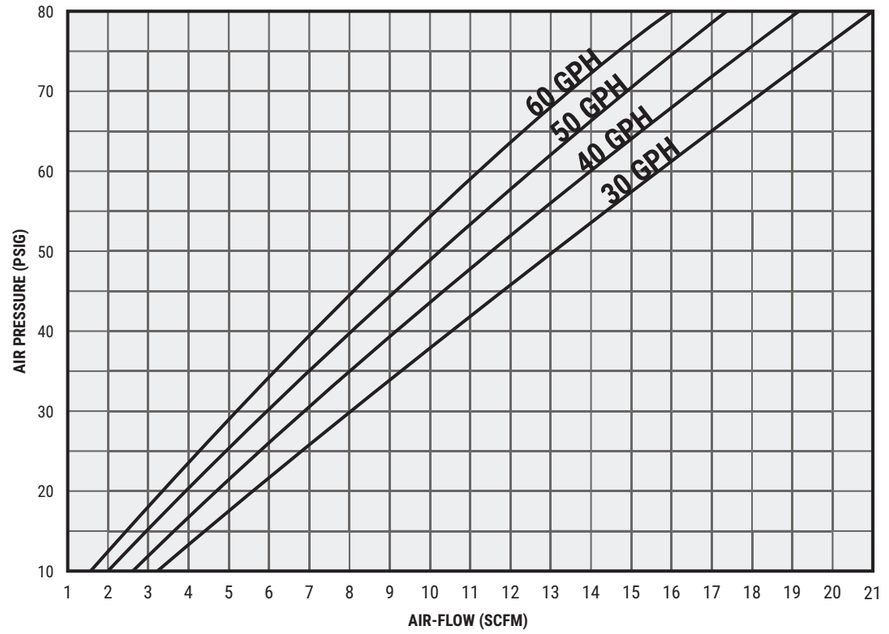
Construction and Materials

Four-Piece construction:

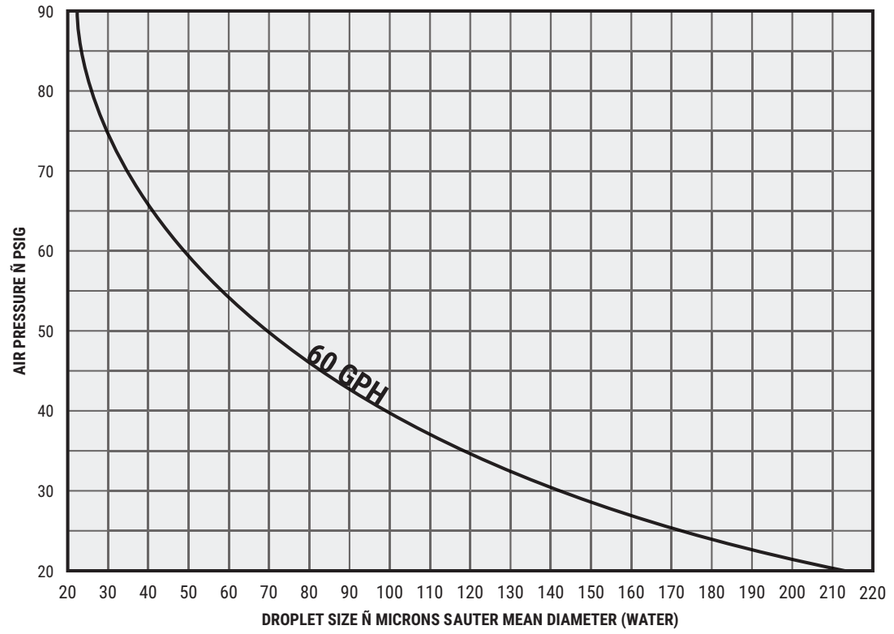
1. nozzle body (adapter)
2. swirl chamber
3. metering set (integral nut and pintle)
4. nozzle cap

Parallel and concentric bodies (adapters) are available. Both are shown in the dimensional drawings. Standard nozzle material is mild steel for all four basic parts. Other materials available on special request.

Air Flow vs. Air Pressure (60 GPH Nozzle)



Droplet Size vs. Air Pressure (60 GPH Nozzle)



DELAVAN® SPRAY TECHNOLOGIES

Swirl-Air™

Swirl-Air Nozzle Capacities (Based on #2 fuel oil)

The capacities shown rate each nozzle according to minimum atomization energy expended per gallon of #2 oil burned. For example, both the 150 gph and 200 gph nozzles are flow rated at 150 gph, but the 200 gph nozzle has a higher air/fuel ratio. The wide turn-down capability also permits each nozzle to be operated at capacities less than shown. However, very low flows would require installation of a fuel metering pre-orifice or valve to prevent oscillation or "chugging" in the fuel line or system. Ideally, a nozzle should be selected for minimum energy used for atomization and for optimum burner performance.

50GPH #34429 & #3446

Air Pressure (PSIG)														
Flow Rate (GPH)	20		30		40		50		60		70		80	
	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)
5	6	2.2	8	2.8	10	3.5	14	4.2	17	5.2	20	5.7	23	6.2
10	11	2.1	15	2.7	18	3.3	21	4.1	26	4.8	30	5.5	33	6.1
15	16	1.9	22	2.5	25	3.2	30	3.9	34	4.6	38	5.4	43	6.1
20	23	1.8	28	2.3	33	3.0	39	3.8	43	4.5	48	5.1	51	6.0
25	30	1.6	36	2.2	42	2.8	47	3.6	52	4.4	57	5.0	62	5.9
30	38	1.4	44	2.1	50	2.7	56	3.5	62	4.2	67	4.9	72	5.8
40	56	1.3	63	2.0	69	2.6	77	3.4	83	4.1	88	4.8	93	5.7
50	78	1.2	87	1.9	92	2.5	100	3.3	107	4.0	112	4.7	120	5.4

60GPH #33240 & #34890

Air Pressure (PSIG)														
30	19	5.7	27	7.8	35	10.5	43	13.0	51	15.5	59	18.5	68	21.0
40	20	4.8	28	6.8	37	9.0	46	11.5	54	14.0	61	17.0	70	19.0
50	21	4.0	30	6.0	39	8.0	48	10.5	56	12.5	65	15.0	73	17.5
60	22	3.5	31	5.3	40	7.1	49	9.4	58	11.5	67	13.5	76	16.0

100GPH #33515 & #34892

Air Pressure (PSIG)														
60	20	6.2	27	9.0	35	12.0	42	15.0	49	18.5	57	21.5	64	24.5
70	21	5.7	29	8.1	37	11.0	44	14.0	52	17.0	59	20.5	67	23.0
80	23	5.2	31	7.5	39	10.5	47	13.5	55	16.5	62	19.0	70	22.0
90	25	4.6	33	6.8	41	9.5	49	12.0	57	15.0	64	18.0	72	21.0
100	26	4.2	35	6.2	43	9.0	51	11.5	59	14.5	67	17.0	75	20.0

150GPH #33522 & #348924

Air Pressure (PSIG)														
Flow Rate (GPH)	20		30		40		50		60		70		80	
	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)	Liquid Δ P	Air Flow (SCFM)
100	21	7.2	28	10.5	34	14.5	41	18.0	47	22.0	53	25.5	59	29.0
110	23	6.6	30	10.0	37	14.0	43	17.5	49	21.5	56	24.5	62	28.5
120	25	6.3	32	9.6	39	13.5	45	17.0	52	20.5	59	24.0	65	28.0
130	26	5.9	34	9.1	41	12.5	48	16.5	55	20.0	61	23.5	67	27.5
140	28	5.4	36	8.6	43	12.0	50	15.5	57	19.5	64	23.0	71	26.5
150	30	5.3	38	8.2	46	11.5	53	15.0	60	18.5	67	22.5	73	26.0

200GPH #33527 & #34896

Air Pressure (PSIG)														
150	23	6.6	31	10.5	38	14.5	46	18.5	53	22.5	60	26.5	66	31.5
160	24	6.4	32	9.9	40	13.5	47	18.0	54	22.0	62	26.0	68	30.5
170	25	6.1	33	9.4	41	13.0	49	17.0	56	21.0	63	25.5	70	29.5
180	26	5.7	35	9.1	42	12.5	50	16.0	58	20.0	65	24.5	72	28.5
190	28	5.5	36	8.6	44	12.0	51	15.5	59	19.5	67	23.5	74	28.0
200	29	5.2	37	8.1	45	11.5	53	15.0	61	19.0	68	23.0	76	27.0

250GPH #33533 & #34898

Air Pressure (PSIG)														
200	24	7.5	32	11.5	38	16.0	46	20.5	52	24.5	59	29.5	65	34.5
210	25	7.2	33	11.0	40	15.5	47	20.0	54	24.0	60	29.0	67	33.5
220	26	6.9	34	10.5	41	15.0	48	19.5	55	23.5	61	28.5	68	33.0
230	27	6.4	35	10.0	42	14.5	49	18.5	56	23.0	63	27.5	70	32.0
240	28	6.2	36	9.8	43	14.0	51	18.0	58	22.5	64	27.0	71	31.5
250	29	5.9	37	9.4	44	13.5	52	17.5	59	22.0	66	26.5	73	31.0

300GPH #33538 & #34900

Air Pressure (PSIG)														
250	23	8.8	31	13.5	38	19.0	45	24.0	52	29.5	58	35.0	64	40.0
260	24	8.6	32	13.0	39	18.5	46	23.5	53	28.5	59	34.0	65	39.5
270	25	8.3	33	13.0	40	18.0	47	23.0	54	28.0	60	33.5	67	39.0
280	26	7.9	34	12.5	41	17.5	48	22.5	55	27.5	62	33.0	68	38.5
290	27	7.5	35	12.0	42	17.0	49	22.0	56	27.0	63	32.5	70	38.0
300	28	7.2	36	11.5	43	16.5	50	21.5	57	26.5	64	32.0	71	37.5

Ordering Instructions

WHEN ORDERING SWIRL-AIR NOZZLES, be sure to include both part number and description. Specify the complete assembly number, including the dash number that corresponds to the spray angle you need. To order individual parts, use the part numbers shown, but make sure you add the proper dash number on metering sets to designate spray angle.

EXAMPLE: P/N 33240-3 is a 60 gph 900 parallel inlet nozzle.

Hydration Nozzles

WDA NOZZLE

Small Hollow Cone Nozzle.
Fine atomization with no central distribution

Spray Angles 30°–90°

Material:
Brass, Stainless Steel

Thread:
Male, Female, UNEF

Thread Size:
9/16" - 24 UNEF

Flow Rate: *Based on water at 125 PSIG*

WDB NOZZLE

Small Solid Cone Nozzle.
Uniform distribution across a wide pressure range

Spray Angles 30°–90°

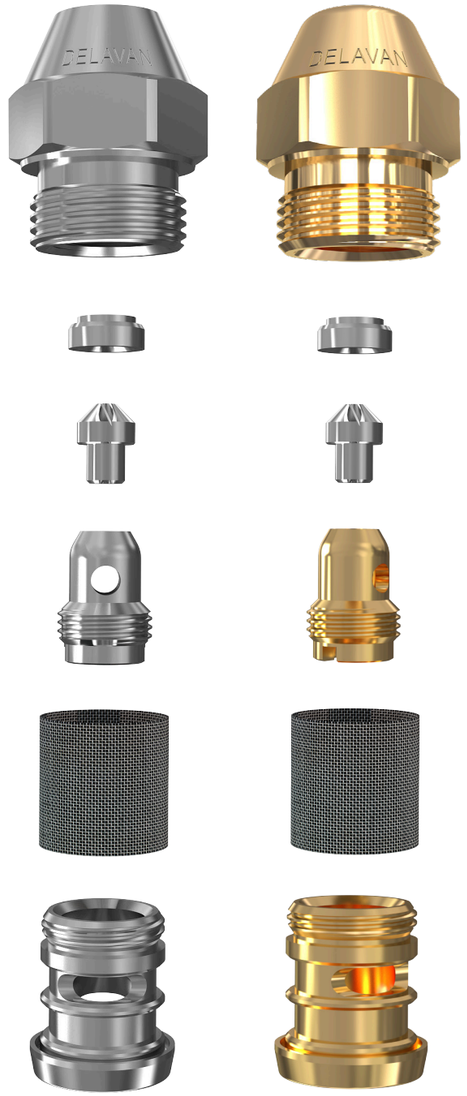
Material:
Brass, Stainless Steel

Thread: *UNEF*

Thread Size:
9/16" - 24 UNEF

Adapters:
1/8" & 1/4" pipe threads.

Flow Rate: *Based on water at 125 PSIG*



Spray Characteristics

- Finely atomized cone spray pattern for humidifying
- WDA has a hollow cone pattern
- WDB has a solid cone pattern
- Available spray angles: 30°, 45°, 60°, 70°, 80°, and 90°.

Nozzle bodies are available in brass or stainless steel with a stainless steel orifice disc. Distributors are stainless steel and retainers are available in brass or stainless steel. Strainers are finished up through WDA/WDB15 (15.0 GPH @ 125 PSIG) with each nozzle.

Ordering Instructions

1. Nozzle number per capacity chart
2. Spray angle
3. Material (brass with stainless steel metering parts will be furnished if material is not specified)
4. Order adapters separately

Adapter Selection Chart

Pipe Size	Adapter P/N		Length	
	Brass	S.S.	Adapter Only	Adapter Plus Nozzle
1/8 NPTF	28737-001	28737-002	1.375"	1.905"
1/4 NPTF	28737-003	28737-004	1.375"	1.905"
3/8 NPTM	28741-001	–	1.375"	1.905"

Type WDA

Nozzle Number	Adapter Thread Sizes			Available Spray Angles						Flow Rate in GAL / Hour at PSIG						
	F 1/8	M 1/8	F 1/4	30°	45°	60°	70°	80°	90°	40	75	100	125	150	300	500
0.5											0.39	0.45	0.50	0.55	0.77	1.00
0.75											0.58	0.67	0.75	0.82	1.16	1.50
1											0.77	0.89	1.00	1.10	1.55	2.00
1.5											1.16	1.34	1.50	1.65	2.32	3.00
2											1.55	1.79	2.00	2.20	3.10	4.00
2.5											1.93	2.24	2.50	2.74	3.88	5.00
3											2.32	2.68	3.00	3.30	4.65	6.00
4										2.20	3.10	3.60	4.00	4.40	6.20	8.00
5										2.80	3.90	4.50	5.00	5.50	7.70	10.00
6										3.60	4.70	5.40	6.00	6.60	9.30	12.00
8										4.50	6.20	7.20	8.00	8.90	12.40	16.00
10										5.60	7.70	8.90	10.00	11.00	15.50	20.00
12										6.80	9.30	10.70	12.00	13.20	18.60	24.00
14										7.90	10.80	12.50	14.00	15.30	21.70	28.00
16										9.00	12.40	14.30	16.00	17.50	24.80	32.00
18										10.10	13.90	16.10	18.00	19.70	27.90	36.00
20										11.30	15.50	17.90	20.00	21.90	31.00	40.00
24										13.50	18.60	21.50	24.00	26.30	37.20	48.00
30										16.90	23.20	25.80	30.00	32.90	46.50	60.00
35										19.80	27.20	31.40	35.00	38.40	54.30	70.00

Type WDA

Nozzle Number	Thread Sizes			Available Spray Angles						Flow Rate in Liters / Hour at Bar G							
	F 1/8	M 1/8	F 1/4	30°	45°	60°	70°	80°	90°	2	3	5	7	10	15	20	35
0.5												1.45	1.72	2.05	2.51	2.87	3.82
0.75												2.16	2.56	3.05	3.74	4.32	5.72
1												2.87	3.40	4.10	5.02	5.77	7.63
1.5												4.32	5.11	6.15	7.53	8.64	11.40
2												5.77	6.83	8.19	10.00	11.60	15.30
2.5												7.19	8.55	10.20	12.50	14.50	19.10
3												8.64	10.20	12.30	15.10	17.30	22.90
4											8.69	11.50	13.70	16.40	20.10	23.10	30.50
5											11.10	14.50	17.20	20.50	25.10	28.70	38.20
6											14.20	17.50	20.60	24.60	30.10	34.60	45.80
8											17.80	23.10	27.50	33.10	40.60	46.20	61.10
10										17.90	22.10	28.70	34.00	41.00	50.20	57.70	76.30
12										21.60	26.90	34.60	40.80	49.20	60.20	69.30	91.60
14										25.30	31.20	40.20	47.70	57.00	69.80	80.80	107.00
16										29.01	35.60	46.20	54.60	65.20	79.80	92.40	122.00
18										32.80	39.90	51.80	61.40	73.40	89.90	104.00	137.00
20										32.80	44.60	57.80	68.30	81.60	99.90	115.00	153.00
24										45.80	53.30	69.30	82.10	98.00	120.00	139.00	183.00
30										54.40	66.80	86.40	102.00	123.00	150.00	173.00	229.00
35										54.40	78.20	101.00	120.00	143.00	175.00	202.00	267.00

☐ Normally Stocked ■ Not Available

WDA Nozzles above 16.0 GPH are furnished without strainers. Max. Design Pressure: 500psig

We offer nozzles flow rate in multiple platforms of different liquid fuels.

Type WDB

Nozzle Number	Adapter Thread Sizes			Available Spray Angles						Flow Rate in GAL / Hour at PSIG						
	F 1/8	M1/4	F1/4	30°	45°	60°	70°	80°	90°	40	75	100	125	150	300	500
0.5											0.39	0.45	0.50	0.55	0.77	1.00
0.75											0.58	0.67	0.75	0.82	1.16	1.50
1											0.77	0.89	1.00	1.10	1.55	2.00
1.5											1.16	1.34	1.50	1.65	2.32	3.00
2											1.55	1.79	2.00	2.20	3.10	4.00
2.5											1.93	2.24	2.50	2.74	3.88	5.00
3											2.32	2.68	3.00	3.30	4.65	6.00
4										2.20	3.10	3.60	4.00	4.40	6.20	8.00
5										2.80	3.90	4.50	5.00	5.50	7.70	10.00
6										3.60	4.70	5.40	6.00	6.60	9.30	12.00
8										4.50	6.20	7.20	8.00	8.90	12.40	16.00
10										5.60	7.70	8.90	10.00	11.00	15.50	20.00
12										6.80	9.30	10.70	12.00	13.20	18.60	24.00
14										7.90	10.80	12.50	14.00	15.30	21.70	28.00
16										9.00	12.40	14.30	16.00	17.50	24.80	32.00
18										10.10	13.90	16.10	18.00	19.70	27.90	36.00
20										11.30	15.50	17.90	20.00	21.90	31.00	40.00
24										13.50	18.60	21.50	24.00	26.30	37.20	48.00
30										16.90	23.20	25.80	30.00	32.90	46.50	60.00
35										19.80	27.20	31.40	35.00	38.40	54.30	70.00

Type WDB

Nozzle Number	Thread Sizes			Available Spray Angles						Flow Rate in Liters / Hour at Bar G							
	F 1/8	M1/4	F1/4	30°	45°	60°	70°	80°	90°	2	3	5	7	10	15	20	35
0.5												1.45	1.72	2.05	2.51	2.87	3.82
0.75												2.16	2.56	3.05	3.74	4.32	5.72
1												2.87	3.40	4.10	5.02	5.77	7.63
1.5												4.32	5.11	6.15	7.53	8.64	11.40
2												5.77	6.83	8.19	10.00	11.60	15.30
2.5												7.19	8.55	10.20	12.50	14.50	19.10
3												8.64	10.20	12.30	15.10	17.30	22.90
4											8.69	11.50	13.70	16.40	20.10	23.10	30.50
5											11.10	14.50	17.20	20.50	25.10	28.70	38.20
6											14.20	17.50	20.60	24.60	30.10	34.60	45.80
8											17.80	23.10	27.50	33.10	40.60	46.20	61.10
10										17.90	22.10	28.70	34.00	41.00	50.20	57.70	76.30
12										21.60	26.90	34.60	40.80	49.20	60.20	69.30	91.60
14										25.30	31.20	40.20	47.70	57.00	69.80	80.80	107.00
16										29.01	35.60	46.20	54.60	65.20	79.80	92.40	122.00
18										32.80	39.90	51.80	61.40	73.40	89.90	104.00	137.00
20										32.80	44.60	57.80	68.30	81.60	99.90	115.00	153.00
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30										54.40	66.80	86.40	102.00	123.00	150.00	173.00	229.00
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WDB Nozzles above 16.0 GPH are furnished without strainers. Max. Design Pressure: 500psig

We offer nozzles flow rate in multiple platforms of different liquid fuels.

DELAVAN® SPRAY TECHNOLOGIES

Nozzle Interchange

Replacing a nozzle of one make with another sometimes presents problems. This is partly due to unique design differences among the various makes, plus the fact that the nozzle manufacturers use different methods for evaluating spray angles, patterns, and spray quality.

In many cases, nozzles with similar patterns and spray angles are directly interchangeable. However, there are other cases where nozzles that would seem to be equivalent are really not. When this happens, it is best to ask the burner manufacturer for a recommendation. Otherwise, it is a matter of trial and error. To see which works best, try nozzles with:

1. Slightly higher or lower flow rates
2. Wider or narrower angles
3. More solid or more hollow patterns

Delavan Nozzle Interchange Chart

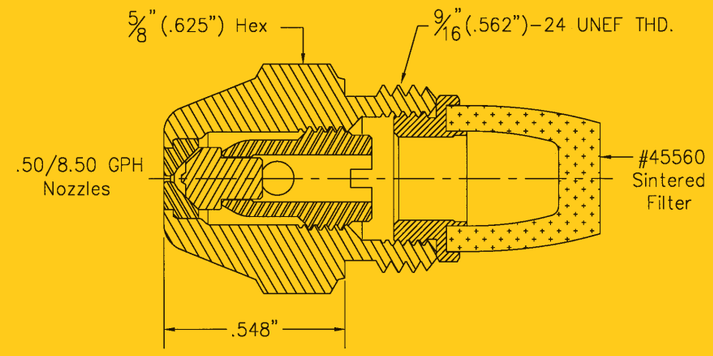
Delavan	Danfoss	Steinen	Fluidics	Monarch
A	H	S	SF	NS
A	HR	PH	HF	PL
B	S	H	HF	PLP
B		SS	SF	R
*W or *B	ES	Q	KSF	AR
*A	EH		KFH	
SS	SS up to 2GPH			
A or W	SS over 2GPH			
MH		MH		

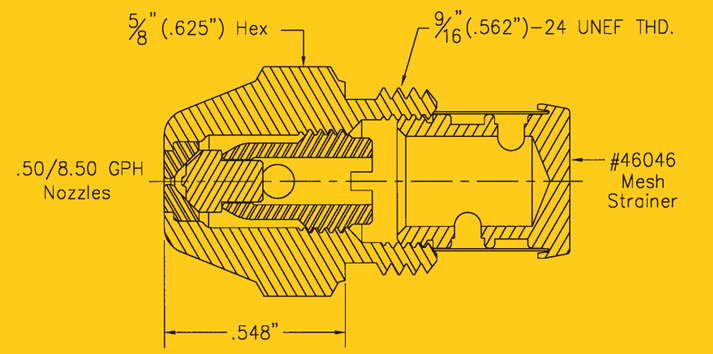
*** Applications with Kerosene**
WARNING: Improper modification to combustion units may create a fire hazard resulting in possible injury. Contact the original equipment manufacturer before modifying the combustion unit.

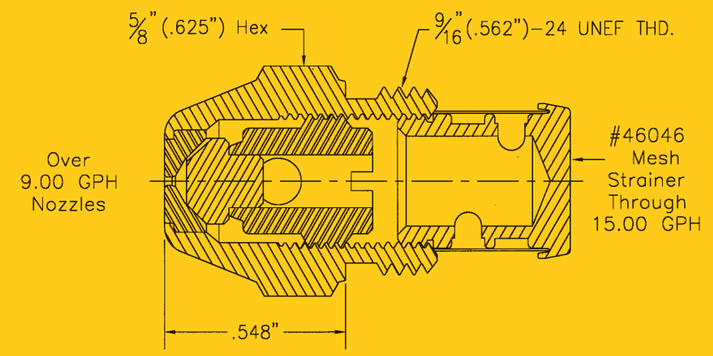
Nozzle Ratings and Testing

Every nozzle is spray tested for flow rate, spray angle, and spray quality. Test conditions include:

viscosity within ± .04 centistoke (.03 SSU) ; pressure at 100 PSI and 145 PSI (for EN 293 and EN 299 compliance) ; fuel temperature at 80° F ± 2°F ; climate controlled test room ; and regularly calibrated pressure gauges and flow meters.







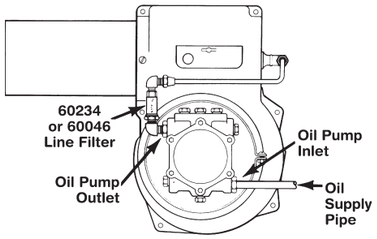
Filters

Line Filter

Use Delavan's line filter for extra filtration in burner applications of 2.00 GPH or less. These offer four times the filtering area of a standard nozzle strainer and twice the protection. A plugged line filter can cause a pressure drop. Check the pressure on the outlet side of the filter while the unit is flowing to see that it is the same as the pump pressure. If less, replace filter.

- 60046 1/8" NPT inlet and outlet threads
- 60234 1/8" SAE 45° flare inlet and outlet threads

*Easy installation



NOTE: Replace the line filter during the annual service check for an economical way to maintain clear lines.

Mesh Strainer

Sintered Filter

Sintered Filters & Strainers

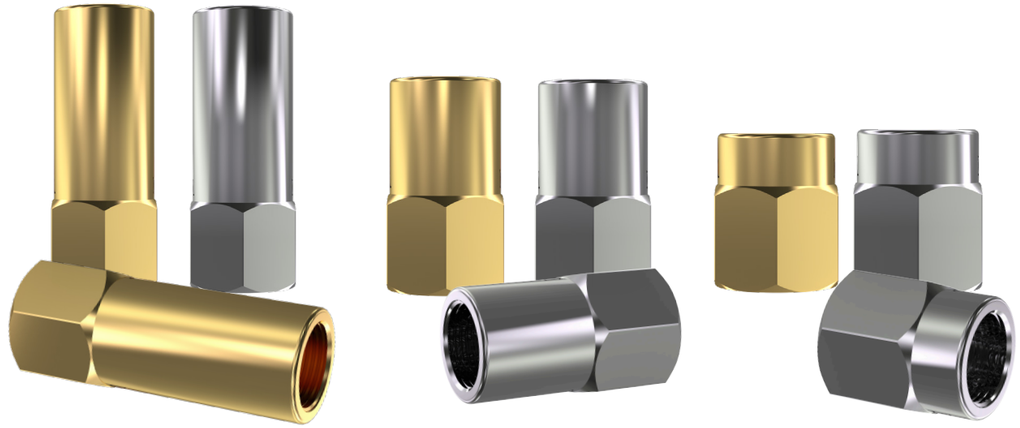
Nozzles up to 2.00 GPH have as standard a sintered filter. From 2.25 up to 15.00, monel filters are provided. Nozzles with throughput of 16.00 GPH and higher have no filter attached.

Sintered Filters & Strainers

Type	Part Number	Media/Mesh Size
Sintered Filter	45560-004	25 Micron
Sintered Filter	45560-001	40 Micron
Mesh Strainer	46046-001	74 Micron/200M
Mesh Strainer	46046-002	125 Micron/120M

It is recommended to use sintered filters on nozzles with low throughput.

Nozzle Adapters



Nozzle Adapters

All nozzle adapters are made in brass and stainless steel with precision machined mating surfaces for proper sealing.

- Specify 1/8" or 1/4" pipe thread size
- All nozzle adapters 9/16-24 UNEF internal thread
- Available in optional stainless steel (contact customer service or sales representative)

Nozzle Adapters

Female Long 2"		Female Standard 1-3/8"		Female Short 15/16"		Male	
Thd Size	Part Number	Thd Size	Part Number	Thd Size	Part Number	Thd Size	Part Number
1/8"	28738-001	1/8"	28737-001	1/8"	28736-001	3/8"	28741-001
1/4"	28738-003	1/4"	28737-003	1/4"	28736-003		

Ordering Instructions

Ordering Options:

Contact your Delavan representative for assistance in finding the right nozzle for your application.

Contact Customer Service:

Phone:
+1-803-245-4347

US Toll Free Number:
+1-800-982-6943

sales@delavan.com

Display Storage Racks

An attractive black plastic display and storage rack is available and will hold up to 120 nozzles (12 vials in 10 slots). It is inexpensive, lightweight, and easy to mount on the wall. Holes are drilled in the rack for easy mounting. This rack is packaged two to a carton; order in multiples of two. Part #47749

Nozzle Boxes

Delavan nozzle boxes handle all brands of nozzle vials. Our 110-nozzle and 55-nozzle boxes are made of heavy gauge steel with rugged hinges and snap-latch construction, finished in baked-on jet black enamel.

#26846-4 110 Nozzle Box (5" x 3 5/8" x 11 15/16")
#26846-5 55 Nozzle Box (5" x 1 3/4" x 11 15/16")

Delavan® offers over 30,000 different components across their product lines.

Delavan®, an R.W. Beckett Company, is a world leader in the design and manufacture of high quality spray nozzles and fluid handling systems. Since 1935, Delavan® has grown to be one of the leading spray nozzle manufacturers. Operating from manufacturing facilities in the United States and in the United Kingdom, Delavan® now supplies more than 30,000 different components to thousands of customers in virtually every imaginable manufacturing and processing industry. Visit us at delavan.com.

DELAVAN®
SPRAY TECHNOLOGIES

Delavan, part of R.W. Beckett, is a world leader in the design and manufacture of high quality spray nozzles and fluid handling systems. Since 1936, we have grown to be one of the leading spray nozzle manufacturers. Operating from dedicated manufacturing facilities, Delavan now supplies more than 30,000 different components to thousands of customers in virtually every manufacturing and processing industry. Our success has been driven by our outstanding service, our manufacturing flexibility, and our technical application expertise to ensure our customers obtain the maximum benefit from the solutions they choose.

Precision Tested.
People Trusted.

DELAVAN®
SPRAY TECHNOLOGIES

For more information on our products and help connecting with a distributor near you, visit ***delavan.com*** or contact us at:

Phone: ***+1-803-245-4347***
US Toll Free Number: ***+1-800-982-6943***
Fax: ***+1-803-245-4146***
General Inquiries: ***sales@delavan.com***

Scan This QR code to download this and other Delavan® product brochures.

bsi ISO 9001 Quality Management Systems CERTIFIED ISO 14001 Environmental Management CERTIFIED

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