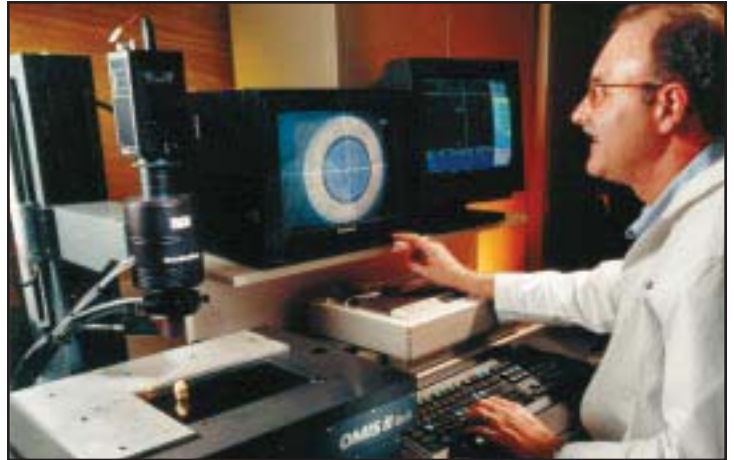


DELAVAN PRECISION OIL BURNER NOZZLES



Delavan has specialized in the development and production of components for highly specialized industries for over 50 years. The Bamberg, South Carolina, plant produces a wide range of oil burner nozzles for domestic and industrial applications as well as accessories for the heating business in general.



Delavan's inspectors have the latest test instruments such as this video projection microscope, here being used to inspect the orifice dimension on the face of the nozzle.



Delavan 100% tests its nozzles for flow rate and spray angle using test oil, maintained to nominal fuel oil properties. Each is rotated to check symmetry and spray quality, and to look for any voids, streaks, or pulsations in the spray pattern.



Delavan inspectors audit nozzle components numerous times during production prior to assembling and testing. These checks are done to ensure the highest quality product is delivered.

Delavan has been designing and manufacturing nozzles for oil heating industry for over 60 years. Quality assurance was important to us way back then and still is today. Since those early days, Delavan has grown and expanded into other product lines as well, such as gas turbine engine nozzles and accessories; nozzles, pumps and accessories for agricultural and industrial spraying.

Delavan is unique in the oil heating industry because we have developed training materials and programs to educate the oil heating service technician. Our nozzles are the most widely distributed in the U.S. and Canada and are also exported to many other countries. Delavan is the leader in designing and manufacturing nozzles for special industrial combustion applications. We specialize

in assisting original equipment manufacturers in designing and specifying the best nozzles to fit their applications.

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

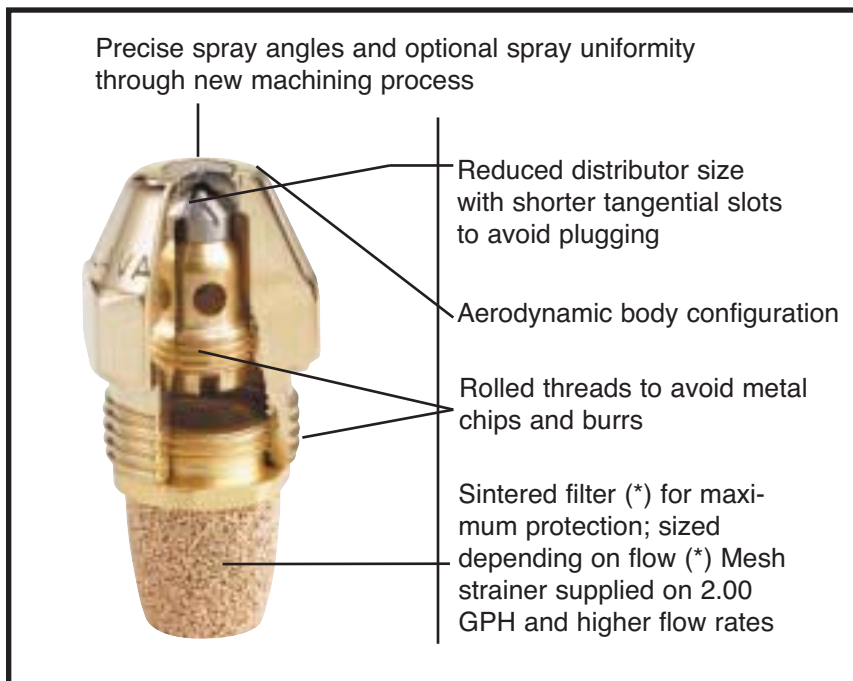
DELAVAN 

Fuel Metering Products Operation
P.O. Box 969 • Bamberg • South Carolina 29003
www.delavaninc.com

DELAVAN PRECISION OIL BURNER NOZZLES

Why is Delavan so different?

→ UNIQUE INSIDE ANTI PLUG CONSTRUCTION



100% Tested

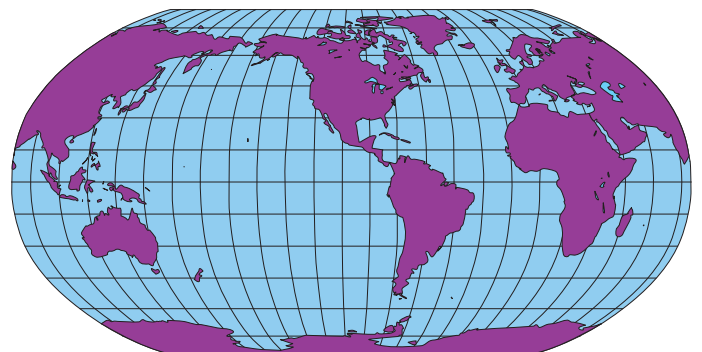
Every nozzle tested. Then we go one step further and clean the test oil from the nozzle to avoid plugging.

MEET THE CHALLENGE

- World leader in spray technology
- ISO 9001 Certified
- State of the art manufacturing equipment
- High technology research, design and quality assurance methods

THE WORLD DIMENSION

- Two manufacturing facilities with R and D in the USA.
- Manufacturing and marketing facility in the UK.
- Marketing and technical services in Belgium.
- Intercontinental distribution network



DELANAN PRECISION OIL BURNER NOZZLES

DELANAN
ProTek™
NOZZLE SYSTEM

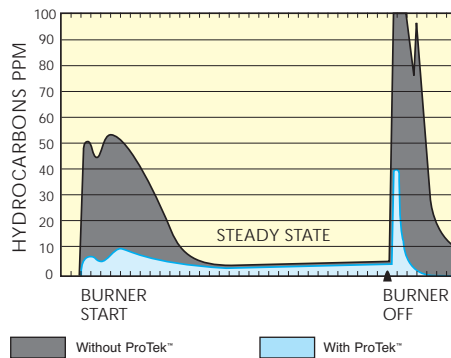
**SMART VALVE
 DESIGN REDUCES
 COMBUSTION
 POLLUTION FOR
 CLEANER HEATING**



The all-new 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 pollutants for cleaner air. The ProTek Nozzle 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 set up efficiency longer and extend the time period between appliance clean ups.

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 comparably rated Delavan nozzles.

The dramatic benefits of the ProTek Nozzle System are available in either a factory-installed, complete system or as the ProTek Valve Component sold separately to replace the standard filter on a Delavan nozzle.



Hydrocarbon emissions are greatly reduced when the Delavan ProTek™ Nozzle System is used. Hydrocarbons are typically elevated at start-up and shut-down of the nozzle firing, as both of these graphs show. When the ProTek Nozzle System is installed, the dramatic benefits are seen in these charts which show comparative results with and without the ProTek™ valve. Results will vary by application.

TEK TALK

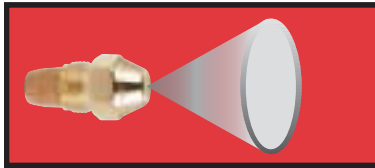
The Delavan ProTek™ Nozzle System has been thoroughly tested. In the tests, approximately seven years of "on/off" cycle operation simulation in the laboratory with no failures. A total of 107,000 cycles were recorded. After the first 11,350 cycles, the cut-on pressures shifted upward an average of 3.0 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

Valve Part #	Minimum Operating Pressures		
	Supply Pump PSI (BAR)	Valve Open PSI (BAR)	Valve Close PSI (BAR)
60030-1	135.0 (9,3)	125.0 (8,6)	65.0 (4,5)
60030-2	100.0 (7,0)	60.0 (4,1)	45.0 (3,1)

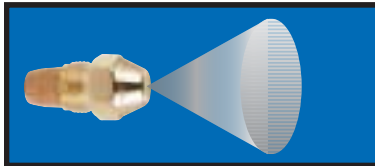
DELAVAN PRECISION OIL BURNER NOZZLES

A VARIETY OF NOZZLES THAT SUITS EVERY APPLICATION



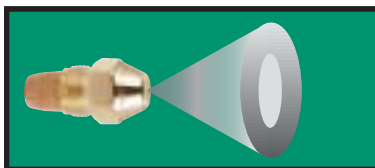
A
Red Vial

HOLLOW-CONE Type A-nozzles are mainly used on burners with a hollow cone air pattern and for through puts up to 2.00 GPH. The droplet distribution is concentrated on the outside of the cone and results in good ignition and low-noise combustion.



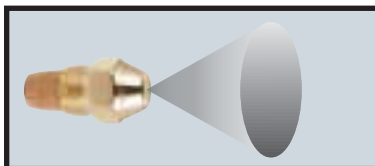
B
Blue Vial

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.



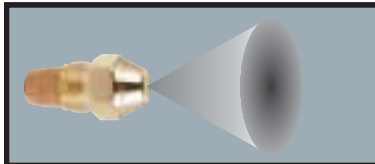
W
Green Vial

Type W "ALL PURPOSE" -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 solid.



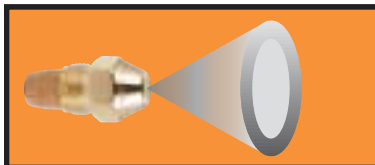
AR-D
Light Grey Vial

Type AR-D Nozzles are of a "solid cone" type 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).



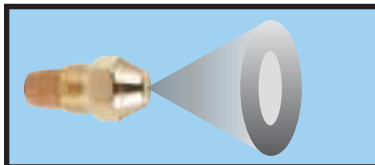
R-D
Dark Grey Vial

Type R-D Nozzles 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.



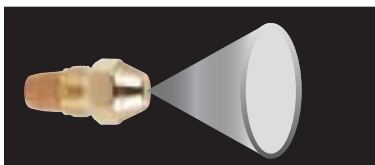
MH
Orange Vial

Type .579 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.



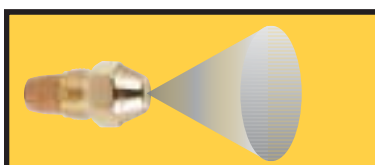
SS
Powder Blue Vial

Semi-Solid nozzle (.50-2.00) 60°, 70° and 80° spray angles; interchanges with other SS nozzles.



A
Black Vial

Del-O-Flo™ nozzles are low-capacity nozzles designed to minimize the plugging problems associated with very low flow rates. The special interior design of the Del-O-Flo™ flushes contaminants through, limiting build-up. These nozzles will satisfactorily interchange with other hollow and solid cone nozzles. The Del-O-Flo™ is available in 0.40 GPH up to 0.85 GPH.



B
Yellow Vial

DeLavan PRECISION OIL BURNER NOZZLES

Oil Burner Nozzles For Residential Applications AVAILABLE NOZZLE SIZES

Types A and B						
GPH	30°	45°	60°	70°	80°	90°
.40	Red	Green				
.50	Yellow	Green				
.55	Yellow	Green				
.60	Yellow	Green				
.65	Yellow	Green				
.70	Yellow	Green				
.75	Yellow	Green				
.80	Yellow	Green				
.85	Yellow	Green				
.90	Yellow	Green				
1.00	Yellow	Green				
1.10	Yellow	Green				
1.20	Yellow	Green				
1.25	Yellow	Green				
1.35	Yellow	Green				
1.50	Yellow	Green				
1.65	Yellow	Green				
1.75	Yellow	Green				
2.00	Yellow	Green				
2.25	Yellow	Green				
2.50	Yellow	Green				
2.75	Yellow	Green				
3.00	Yellow	Green				
3.25	Yellow	Green				
3.50	Yellow	Green				
4.00	Yellow	Green				
4.50	Yellow	Green				
5.00	Yellow	Green				
5.50	Yellow	Green				
6.00	Yellow	Green				
6.50	Yellow	Green				
7.00	Yellow	Green				
7.50	Yellow	Green				
8.00	Yellow	Green				
8.50	Yellow	Green				
9.00	Yellow	Green	Green	Green	Green	Green
10.00	Yellow	Green	Green	Green	Green	Green
11.00	Yellow	Green	Green	Green	Green	Green
12.00	Yellow	Green	Green	Green	Green	Green
13.00	Yellow	Green	Green	Green	Green	Green
14.00	Yellow	Green	Green	Green	Green	Green
15.00	Yellow	Green	Green	Green	Green	Green
16.00	Red	Green	Green	Green	Green	Green
17.00	Red	Green	Green	Green	Green	Green
18.00	Red	Green	Green	Green	Green	Green
19.00	Red	Green	Green	Green	Green	Green
20.00	Red	Green	Green	Green	Green	Green
22.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
24.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
26.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
28.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
30.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
32.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
35.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
40.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
45.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow
50.00	Red	Yellow	Yellow	Yellow	Yellow	Yellow

Type W						
GPH	30°	45°	60°	70°	80°	90°
.40	Red	Green				
.50	Yellow	Green				
.55	Yellow	Green				
.60	Yellow	Green				
.65	Yellow	Green				
.70	Yellow	Green				
.75	Yellow	Green				
.80	Yellow	Green				
.85	Yellow	Green				
.90	Yellow	Green				
1.00	Yellow	Green				
1.10	Yellow	Green				
1.20	Yellow	Green				
1.25	Yellow	Green				
1.35	Yellow	Green				
1.50	Yellow	Green				
1.65	Yellow	Green				
1.75	Yellow	Green				
2.00	Yellow	Green				
2.25	Yellow	Green				
2.50	Yellow	Green				
2.75	Yellow	Green				
3.00	Yellow	Green				
3.25	Yellow	Green				
3.50	Yellow	Green				
4.00	Yellow	Green				
4.50	Yellow	Green				
5.00	Yellow	Green				
5.50	Yellow	Green				
6.00	Yellow	Green				
6.50	Yellow	Green				
7.00	Yellow	Green				
7.50	Yellow	Green				
8.00	Yellow	Green				

Del-O-Flo Type A and B					
GPH	45°	60°	70°	80°	90°
.40	Green				Red
.50	Green				
.55	Green				
.60	Green				
.65	Green				
.75	Green				
.80	Green				
.85	Green				

Type SS					
GPH	45°	60°	70°	80°	90°
.50	Red	Green			Red
.60	Red	Green			Red
.65	Red	Green			Red
.75	Red	Green			Red
.85	Red	Green			Red
1.00	Red	Green			Red
1.10	Red	Green			Red
1.20	Red	Green			Red
1.25	Red	Green			Red
1.35	Red	Green			Red
1.50	Red	Green			Red
1.65	Red	Green			Red
1.75	Red	Green			Red
1.75	Red	Green			Red
2.00	Red	Green			Red

.579 MH Mobile Home Nozzle	
	Normally Stocked
Green	Limited Inventory
Yellow	Special Order
Red	Not Available

Types AR-D and RD					
GPH	45°	60°	70°	80°	90°
.50	Red				Red
.60	Red				Red
.65	Red				Red
.75	Red				Red
.85	Red				Red
1.00	Red				Red
1.10	Red				Red
1.20	Red				Red
1.25	Red				Red
1.35	Red				Red
1.50	Red				Red
1.65	Red				Red
1.75	Red				Red
1.75	Red				Red
2.00	Red				Red

Delavan PRECISION OIL BURNER NOZZLES

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 really are not. When this happens it is best to ask the burner manufacturer for a recommendation. Otherwise, it is a matter of trial and error: (1) Trying nozzles with slightly higher or lower flow rates, (2) wider or narrower angles and (3) more solid or more hollow patterns, to see which one performs best.

Nozzle Interchange Chart	
Spray Angles 30° through 90°	
HAGO/SID HARVEY	DELANVAN
H	A
SS (up to 2.0)	SS
SS (over 2.0)	A or W
ES/P	B*
B	B*
MONARCH	DELANVAN
NS/PL	A
R/AR (up to 2.0)	R-D/AR-D
R/AR (over 2.0)	A/A or W
PLP	B*
DANFOSS	DELANVAN
AS	W or B
AH	A

*The original B Nozzle

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.

P.O. Box 969 • Bamberg, SC 29003
www.delavaninc.com

1-800-982-6943

NOZZLE RATINGS AND TESTING

Every nozzle is spray tested for flow rate, spray angle and spray quality. Our nozzles are flow rated at 100 psi. Test conditions include: fuel gravity within a total spread of 1-1/2° API . . . viscosity within ± .04 centistoke (.03 SSU) . . . pressure at 100 psi . . . fuel temperature at 80°F, ± 2°F . . . an air-conditioned test area maintained at a temperature spread of 4°F or less . . . and regularly calibrated pressure gauges and flow meters.

BURNER/NOZZLE SELECTION

Proper nozzle selection is a subject of great importance because the performance of the nozzle is so directly related to the overall performance of the burner. The wrong choice of flow rate, spray angle or spray pattern for a given burner air pattern can result in improper firing.

To match a nozzle to a burner takes field-service experience, or trial-and-error, or a good foundation of understanding angles, rates and patterns. Refer to Delavan's service technicians guide #884, "A Total Look at Oil Burner Nozzles" for more technical information on nozzle selection and understanding angle, rates and patterns. Also refer to the Burner Manufacturers' Recommendations Chart below.

Manufacturer	Model	Delavan Nozzle	
Aero Burner	F-AFC	80° W, A or B	
	HF-US	80° W, A or B	
	HF-AFC	80° W, A or B	
	SV-SSV	70° or 80° B	
R.W. Beckett	AF/FG (F)	60°, 70° or 80° A or B (100-150 PSI)	
	AF/AFG (M)	60° or 70° A or B (100-150 PSI)	
	AFII (FB)	45°, 60° or 70° A, W or B (140-200 PSI)	
	AF II (HLX)	45°, 60° or 70° A, W or B (140-200 PSI)	
The Carlin Co.	99 FRD (Std.)	.50-.75 GPH	60°A
		.85-3.00 GPH	45°A, 60°A or B
	100 CRD (Std.)	.50-.75 GPH	60°A
		.85-2.25 GPH	45°A, 60°A or B
		.75-1.10 GPH	60°
	Elite EZ-1	.50-1.00 GPH	70°A
		.50-.85 GPH	60° SS
1.00-1.65 GPH		60° or 70°	
Elite (EZ-2,3)	All Flow Rates	60° A, B or SS	
Riello Burners	Mectron 3M	60° W, B, or Del-O-Flo A	
	5M	(Up to to .85 GPH)	
	F3, F.5	.40-1.25 GPH	60° or 80° W or A
	F10	1.25-2.50 GPH	60° or W or B
	F15, F20	2.00-5.00 GPH	45° or 60° W or B
	R35.3, R35.5	.50-1.25 GPH	60° or 80° W or B
Press Series	2.00-12.00 GPH	60° or 45° B or W	
Intertherm	MAC 1265	P/N 6601-181 or .55 GPH 90° W or .579 MH	
	MSH 066	.50-80°A	
	MSH 086	.65 - 80° A	
Wayne Home Equipment	P100	.50-1.00 GPH	60°, 70°, 80° A or B
	EHASR	.75-3.00 GPH	80°, 70°, 60° **
	MSR	.75-2.75 GPH	80°, 70°, 60° **
	HS	.50-2.50 GPH	80°, 70°, 60° **
	HS	.50-3.00 GPH	80°, 70°, 60° B
	EG-1	.50-3.00 GPH	80°, 70°, 60° **
		**Under 1.00 GPH use A; above 1.00 use B.	
Weil-Mclain	QB180 (150 PSI)	.55-1.80 GPH	45°, 60°, 70°, 80° A or B
	QB300 (140 PSI)	1.75-3.00 GPH	45°, 60°, 70°, 80° B

*Effective November 1999. Subject to updating by burner manufacturers. For models not listed contact burner manufacturer. Always follow the appliance manufacturer's instructions for the correct nozzle specification.

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.

NOTE: Information on this chart is to be used as a general guide only.