- *Two Swirl-Air nozzle versions are available: the right angle nozzle (atomising air enters the side, the liquid enters axially in back): and the in-line nozzle (concentric piping is used with the liquid in the centre and atomising air around the outside). Concentric pipe adaptors are optional and not included with the nozzle assembly.*

FEATURES

- *Large internal passages with no vanes or cores assure unrestricted flow with little chance for clogging.*
- *No external struts or supports to interfere with spray pattern.*
- *Nozzle design provides for vortex mixing, primary impingement, fluid distortion and external impact for fine atomisation and relatively high nozzle efficiency.*
- *Spray angle can be adjusted through interchangeable nozzle cap assemblies. This feature permits much wider spray patterns than are possible with most types of two fluid atomisers.*
- *Air flow (M^3/min) and power requirements are relatively low, permitting specification of smaller air compressors.*
- *Good atomisation over wide turn-down ratios.*
- *Droplet size is controlled by minor changes in air pressure.*

SPRAY CHARACTERISTICS

- *Air is introduced tangentially into the nozzle chamber in low pressure region of the swirling liquid, creating extreme turbulence and primary atomisation. As liquid 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 atomisation).*
- *Nominal spray angles of 50º, 75º, 100º can be attained by specification of interchangeable nozzle caps. Contact Delavan's Customer Service Team for special spray angles up to 180º.*
- *Mean droplet diameters in the 50 to 100 micrometres range at modest air pressures and flow rates.*
- *Degree of atomisation is also variable by controlling the ratio of air to liquid.*
- *If air pressure is set initially, and it is necessary to modulate the liquid flow, the air pressure and flow rates will automatically respond in such a way that the quality of atomisation remains nearly constant. In some applications, this can result in savings through the elimination of air valving and controls.*

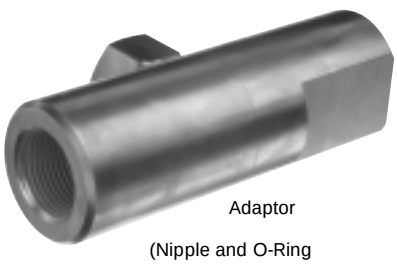
Right Angle
Nozzle Assembly

CONSTRUCTION AND MATERIALS

- *Two piece construction, the nozzle body plus integral deflector ring and cap, easily removable without disturbing pipe connection.*
- *For in-line nozzles the user can alter "C" dimension to any extended length by providing two concentric pipes with a coupling on one end of each. Both made up pipe/coupling lengths should be equal. The length is then the desired addition to "C" dimension.*
- *No external struts or supports to interfere with spray pattern.*
- *Both in-line and right angle versions are available in 316L Stainless Steel and 440 Stainless Steel. Other materials such as Hastelloy C276, Inconel 600, Carpenter 20, Titanium and Carbide lined are available by special order. For other materials, contact Delavan's Customer Service Team.*
- *Large internal passages with no vanes or cores assure unrestricted flow with little chance for clogging.*

Nozzle -
Max. Design Pressure: 14 Bar.G.
Max. Design Temperature: 540ºC.

Adaptor -
Max. Design Pressure: 14 Bar.G.
Max. Design Temperature: 150ºC.



Adaptor

(Nipple and O-Ring
included with Adaptor)

In-Line
Nozzle

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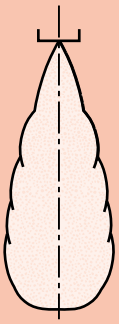
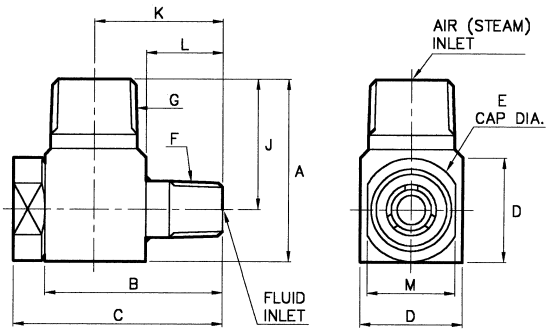
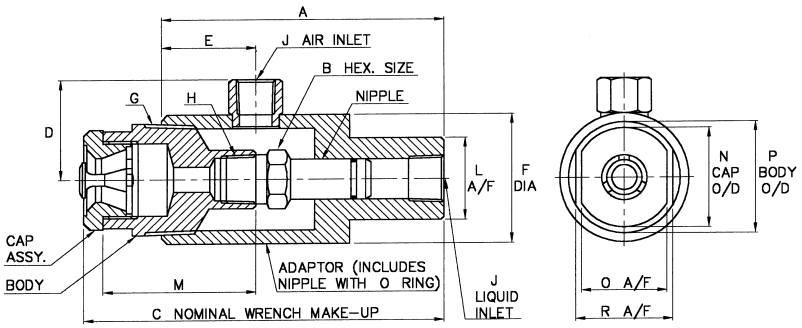




RIGHT ANGLE SWIRL-AIR NOZZLE ASSEMBLY DIMENSIONS (mm)

DIMENSION	RIGHT ANGLE NOZZLE ASSEMBLY DEMENSIONS (mm)					
	45506	31618	31325	31693	31694	32163
A	66,7	54,0	44,5	34,9	28,6	28,6
B	56,4	51,8	46,4	38,1	34,9	34,9
C	64,6	59,2	53,7	42,3	38,5	38,5
D	38,1	31,8	25,4	19,0	15,9	15,9
E	41,3	34,7	28,3	22,0	18,8	18,8
F (NPT)	3/8-18	1/4-18	1/4-18	1/8-27	1/8-27	1/8-27
G (NPT)	3/4-14	3/4-14	1/2-14	3/8-18	1/4-18	1/4-18
J	47,6	38,1	31,8	25,4	20,6	20,6
K	38,1	35,9	33,7	28,6	27,0	27,0
L	19,0	20,0	21,0	19,1	19,1	19,1
M	36,5	31,8	25,4	19,1	15,9	15,9
Approx. weight (g)	430	270	170	77	51	51



IN-LINE SWIRL-AIR NOZZLE ASSEMBLY DIMENSIONS (mm)

DIMENSION	IN-LINE NOZZLE/ADAPTOR DEMENSIONS (mm)			
	32555/32614	32554/32618	32668/32695	32740/32742
A	127,0	120,7	120,7	90,2
B	22,2	15,9	15,9	12,7
C	152,4	146,1	142,8	108,0
D	44,5	39,6	39,6	32,6
E	44,5	58,4	58,4	38,1
F	50,8	41,3	41,3	28,6
L	38,1	31,8	31,8	19,1
M	59,7	53,9	54,0	38,1
N	34,7	28,3	22,0	18,8
O	31,8	25,4	19,0	15,9
P	42,2	33,4	26,7	21,3
R	34,9	28,6	22,2	19,0
G (NPTM)	1 1/4" - 11 1/2	1" - 11 1/2	3/4" - 14	1/2" - 14
H (NPTF)	1/2" - 14	1/4" - 18	1/4" - 18	1/8" - 27
J (NPTF)	1/2" - 14	1/2" - 14	1/2" - 14	1/4" - 18
Approx. weight (g)	1248	1120	1177	462

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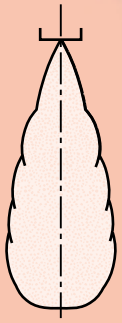


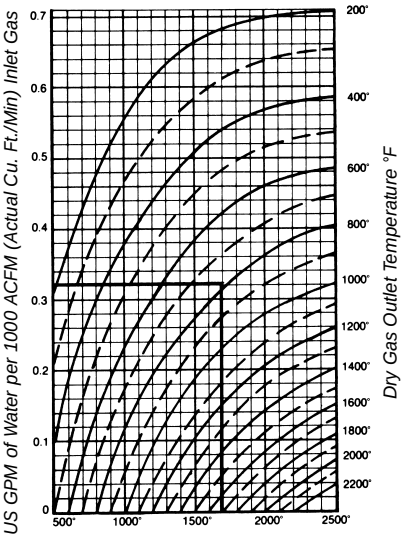
NOZZLE SIZING CHARTS

RIGHT ANGLE NOZZLES

NOMINAL FLOW (LITRES/ MIN)	RIGHT ANGLE NOZZLE ASSEMBLY NUMBER	DASH NUMBERS FOR MATERIAL AND NOMINAL SPRAY ANGLE				CAP ASSEMBLY	
		316 SS	440 HSS	ANGLE (°)	MIN. PASSAGE (mm)	316 SS	440 HSS
93	45506	-2	-	50 (40-60)	6,1	707-97	-
		-1	-	75 (65-85)	4,8	707-96	-
		-3	-	100 (90-110)	3,8	707-98	-
56	31618	-2	-5	50 (40-60)	4,3	707-11	707-26
		-1	-4	75 (65-85)	3,6	707-10	707-25
		-3	-6	100 (90-110)	2,8	707-12	707-27
37	31325	-2	-5	50 (40-60)	2,5	707-8	707-23
		-1	-4	75 (65-85)	2,1	707-7	707-22
		-3	-6	100 (90-110)	1,6	707-9	707-24
15	31693	-2	-5	50 (40-60)	1,7	707-5	707-20
		-1	-4	75 (65-85)	1,7	707-4	707-19
		-3	-6	100 (90-110)	1,7	707-6	707-21
9,5	31694	-2	-5	50 (40-60)	1,3	707-2	707-17
		-1	-4	75 (65-85)	1,3	707-1	707-16
		-3	-6	100 (90-110)	1,3	707-3	707-18
3,8	32163	-11	-	50 (40-60)	0,64	707-93	-
		-2	-	75 (65-85)	0,64	707-13	-
		-7	-	100 (90-110)	0,64	707-29	-
,8		-10	-	50 (40-60)	0,64	707-93	-
		-1	-	75 (65-85)	0,64	707-13	-
		-8	-	100 (90-110)	0,64	707-29	-

* Higher flow rates can be achieved by increasing pressure.

EVAPORATIVE COOLING WATER INJECTION RATES VS. GAS INLET-OUTLET TEMPERATURES



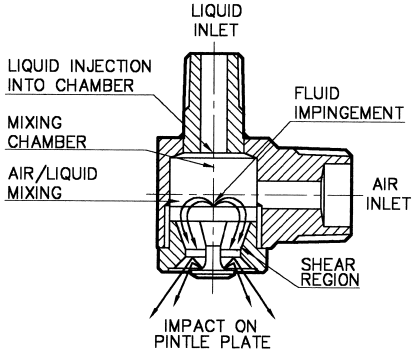
EXAMPLE: 1700°F dry inlet gas to be cooled to 800°F outlet temperature requires 0,32 US GPM water injection per 1000 CFM of inlet gas.

IN-LINE NOZZLES

NOMINAL FLOW (LITRES/ MIN)	NOZZLE ASSEM. NUMBER	DASH NUMBERS FOR MATERIAL AND NOMINAL SPRAY ANGLE			CAP ASSEMBLY		OPTIONAL ADAPTOR
		316 SS	ANGLE (°)	MIN. PASSAGE (mm)	316 SS	440 HSS	
56	32555	-2	50 (40-60)	4,3	707-11	707-26	32614
		-1	75 (65-85)	3,6	707-10	707-25	
		-3	100 (90-110)	2,8	707-12	707-27	
37	32554	-2	50 (40-60)	2,5	707-8	707-23	32618
		-1	75 (65-85)	2,1	707-7	707-22	
		-3	100 (90-110)	1,6	707-9	707-24	
15	32668	-2	50 (40-60)	1,7	707-5	707-20	32695
		-1	75 (65-85)	1,7	707-4	707-19	
		-3	100 (90-110)	1,7	707-6	707-21	
9,5	32740	-2	50 (40-60)	1,3	707-2	707-17	32742
		-1	75 (65-85)	1,3	707-1	707-16	
		-3	100 (90-110)	1,3	707-3	707-18	
3,8		-13	50 (40-60)	0,64	707-93	-	32742
		-4	75 (65-85)	0,64	707-13	-	
		-5	100 (90-110)	0,64	707-29	-	

* Higher flow rates can be achieved by increasing pressure.

Maximum Recommended Pressure: 100 Bar.G.



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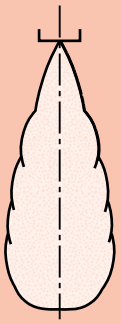
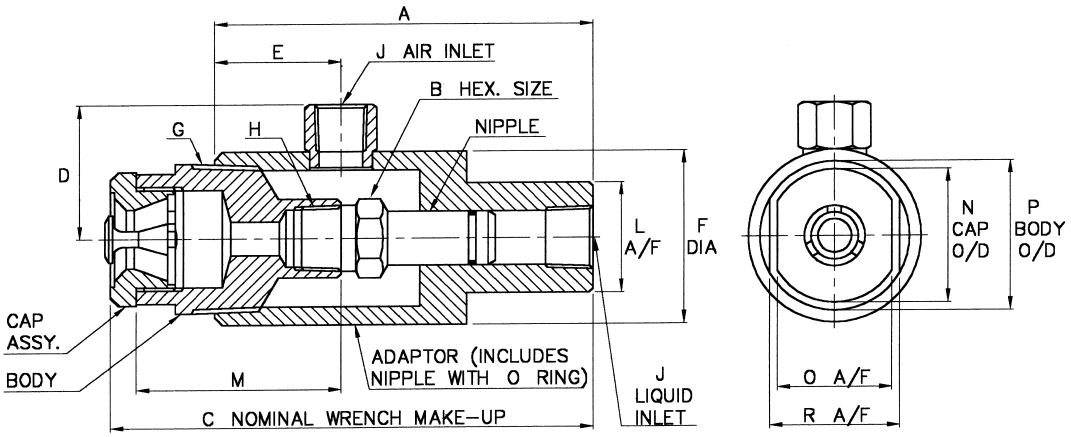


SWIRL-AIR®

AIR ATOMISING

CARBIDE-LINED IN-LINE SWIRL-AIR NOZZLES



NOTE: Nozzle consists of body and cap assembly. Adaptor with nipple must be ordered seperately.

NOZZLE ASSEMBLY DIMENSIONS (mm)

Dimension	In-Line Swirl-Air Nozzle/Adaptor (mm)						
	56 LPM 39144 -1 thru -6	56 LPM 39144 -7	37 LPM 39185 -1 thru -6	37 LPM 39185 -8, -9 & -10	15 LPM 39195 -1 thru -6	15 LPM 39195 -7	9,5 LPM 39225 All dash Nos.
	32614 Adaptor	32614 Adaptor	32618 Adaptor	32618 Adaptor	32695 Adaptor	32695 Adaptor	32742 Adaptor
A	127,0	127,0	120,7	120,7	120,7	120,7	120,7
B	22,2	22,2	15,9	15,9	15,9	15,9	12,7
C	152,4	152,4	150,0	150,0	150,0	150,0	109,2
D	44,5	44,5	39,6	39,6	39,6	39,6	32,6
E	44,5	44,5	58,4	58,4	58,4	58,4	38,1
F	50,8	50,8	41,3	41,3	41,3	41,3	28,6
L	38,1	38,1	31,8	31,8	31,8	31,8	19,1
M	59,7	59,7	53,9	53,9	53,9	53,9	38,1
N	39,5	39,5	31,8	31,8	25,8	25,8	20,3
O	34,9	34,9	28,6	28,6	22,2	22,2	18,3
P	47,4	47,4	37,9	37,9	30,0	30,0	23,6
R	42,1	42,1	33,3	33,3	27,0	27,0	21,4
G (NPTM)	1 1/4" - 11 1/2	1 1/4" - 11 1/2	1" - 11 1/2	1" - 11 1/2	3/4" - 14	3/4" - 14	1/2" - 14
H (NPTF)	1/2" - 14	1/2" - 14	1/4" - 18	1/4" - 18	1/4" - 18	1/4" - 18	1/8" - 27
J (NPTF)	1/2" - 14	1/2" - 14	1/2" - 14	1/2" - 14	1/2" - 14	1/2" - 14	1/4" - 18
Approx. Weight (g)	1304		1134		1106		454

NOZZLE SIZING CHART

		IN-LINE NOZZLES						
Nominal Flow (Litres/Min)	Nozzle Asembly No.	Pintle & Sleeve		Nominal Spray Angle(°)	Min. Passage (mm)	Cap Assembly		Optional Adaptor Part No.
		Tungsten Carbide	Nickel Carbide			Tungsten Carbide	Nickel Carbide	
56	39144	-2	-5	50 (40-60)	4,3	39138-1	39138-2	32614
		-1	-4	75 (65-85)	3,6			
		-3	-6	100 (90-110)	2,8			
37	39185	-2	-5	50 (40-60)	2,5	39184-1	39184-2	32618
		-1	-4	75 (65-85)	2,1			
		-3	-6	100 (90-110)	1,6			
15	39195	-2	-5	50 (40-60)	1,7	39197-1	39197-2	32695
		-1	-4	75 (65-85)	1,7			
		-3	-6	100 (90-110)	1,7			
9,5	39225	-2	-5	50 (40-60)	1,3	39226-1	39226-2	32742
		-1	-4	75 (65-85)	1,3			
		-3	-6	100 (90-110)	1,3			

* Higher flow rates can be achieved by increasing pressure.

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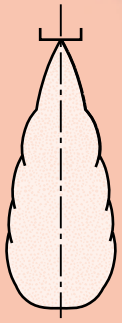
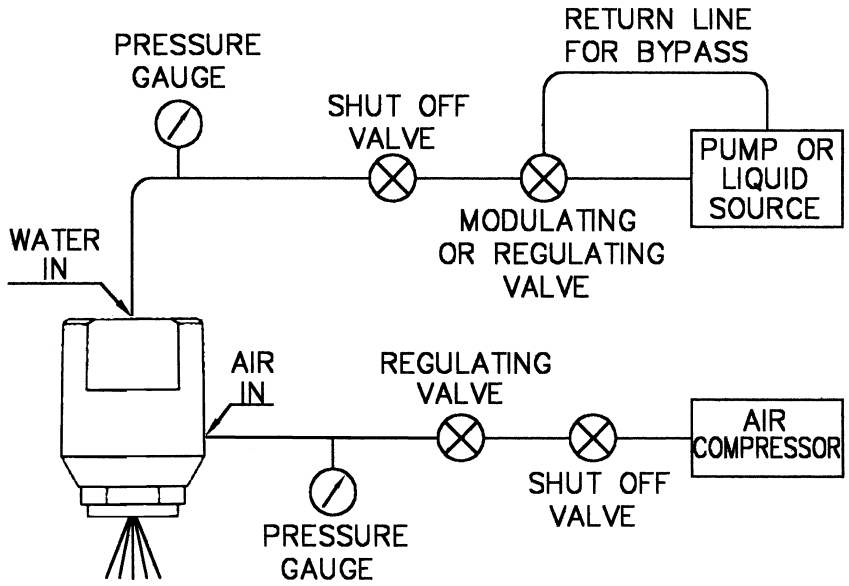
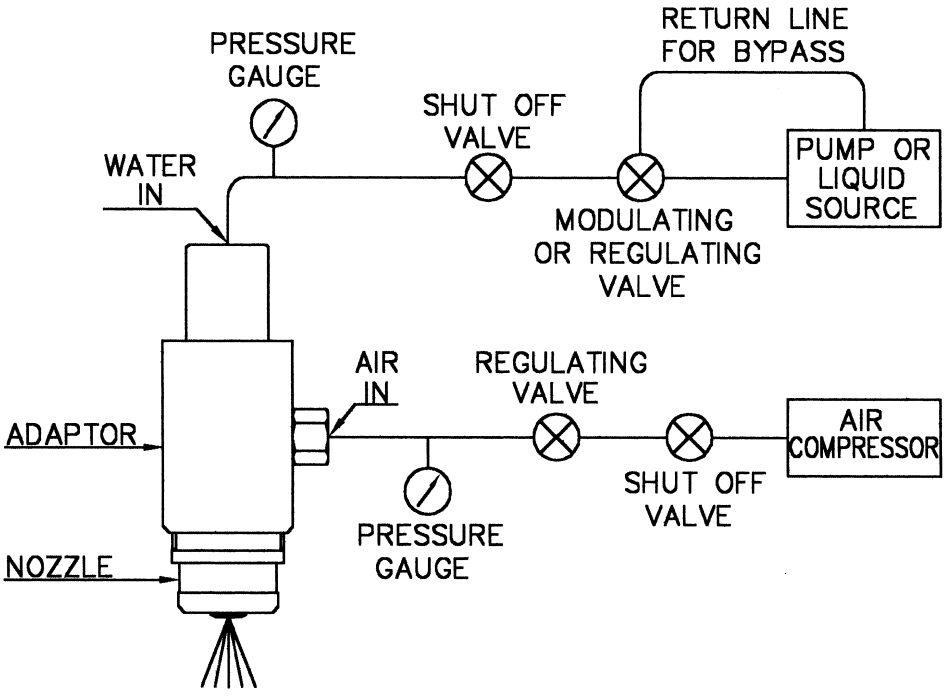


TYPICAL NOZZLE INSTALLATIONS

RIGHT ANGLE SWIRL-AIR NOZZLE



IN-LINE SWIRL-AIR NOZZLE



1. *Install nozzle as shown in schematic drawing above. Make certain both pressure gauges are located as close to the nozzle as practical. Allow for pressure losses between gauges and nozzle when establishing settings. Shut-off valves are included for convenience, allowing nozzle removal without shutting down system.*
2. *Always start air flow first, then liquid flow. On shut-down, stop liquid flow first, then air flow. Adjust air and liquid pressures simultaneously; each affects the other. Check liquid flow rate after system reaches equilibrium.*
3. *In-Line Version: The adaptor shown may be purchased from Delavan. It is not part of the nozzle.*
4. *In-Line Version: Concentric piping can be used between adaptor and nozzle, making it possible to position the adaptor in an ambient temperature area and the nozzle within the walls of a high temperature chamber. Contact Delavan for installation drawing SK6072.*

NOTE: For gas cooling applications, it is recommended that the air flow continues through nozzles after liquid flow is stopped.

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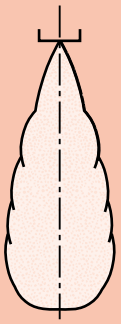


SWIRL-AIR®

AIR ATOMISING

DROPLET SIZE DATA

The generation of small droplets by Swirl-Air nozzles is due to the efficient utilisation of pneumatic energy. Although the spectrum of droplet diameters typically covers a rather wide range, the Sauter mean diameter ($\bar{D}_{32}$) is commonly used to compare and select nozzles for specific industrial processes such as evaporative cooling and spray drying.

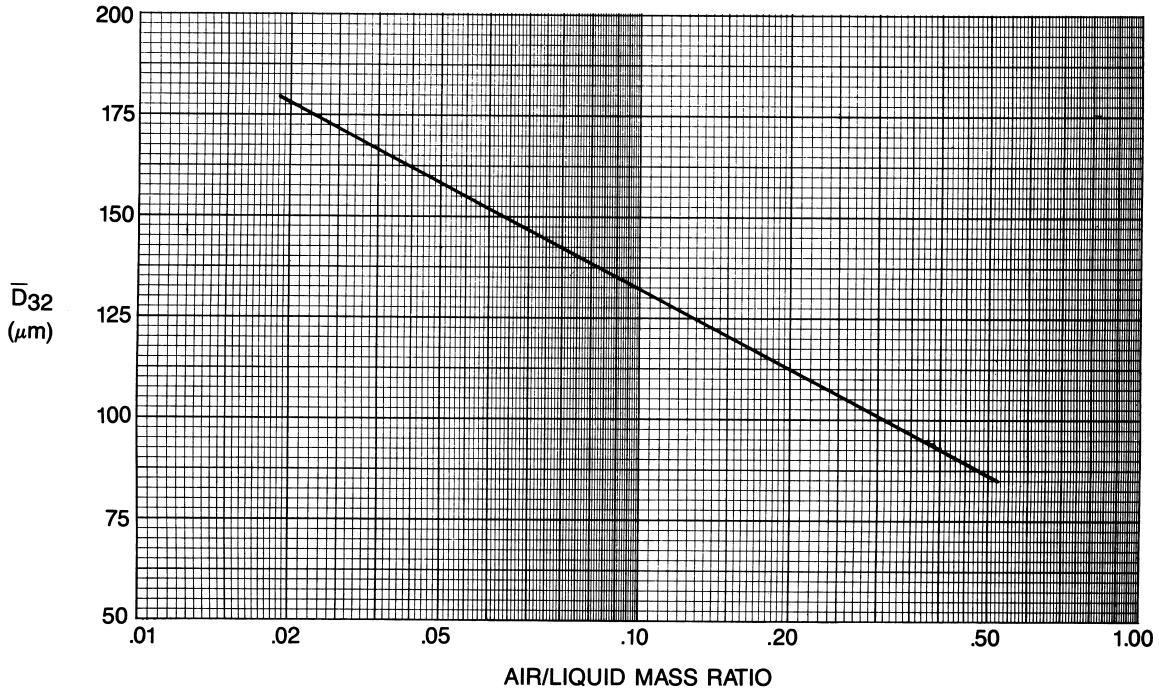
In the graph $\bar{D}_{32}$ is shown as a function of the air/liquid mass ratio for a Swirl-Air nozzle tested at air pressure between 3 and 7 Bar.G. and water rates in the range of 0,37 to 3,7 litres per minute.

This correlation can alternatively be expressed as:

$$\bar{D}_{32} = 200 - 66 \text{ LOG (SCFM/GPM)}$$

Similar correlations have been developed for other Swirl-Air nozzles and, in certain instances, include additional terms for air pressure or velocity. The magnitude of $\bar{D}_{32}$ also depends on nozzle size and the liquid properties.

Another important consideration is the droplet-sizing instrument and sampling technique. A number of sophisticated optical systems have been developed in recent years. Unfortunately, there may be serious discrepancies between different types of instruments. Therefore droplet size data should be treated as approximate when specifying nozzles and their operating conditions. Please contact Delavan's Customer Service Team for further information about specific nozzles.



CAPACITY CHARTS

93 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	0,96	1,37	1,79	2,20	2,61	3,00	3,50	3,85	4,26
Right	37	2220	1,37	1,86	2,34	2,82	3,30	3,78	4,25	4,68	5,16
Angle	56	3360	1,86	2,41	2,96	3,51	4,06	4,61	5,16	5,71	6,19
	78	4680	2,33	2,96	3,51	4,13	4,68	5,30	5,85	6,46	7,02
P/N 45506-1	93	5580	3,16	3,71	4,33	4,95	5,51	6,20	6,80	7,50	8,05
	112	6720	3,58	4,26	4,96	5,64	6,33	7,00	7,70	8,40	9,08

93 LPM	LIQUID FLOW		*AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	2,32	3,28	4,22	5,18	6,12	7,08	8,00	9,00	-
Right	37	2220	1,76	2,57	3,43	4,25	5,10	5,95	6,80	7,60	-
Angle	56	3360	1,19	1,93	2,63	3,40	4,10	4,84	5,60	6,30	7,10
	78	4680	0,88	1,47	2,04	2,63	3,34	3,77	4,40	4,93	5,50
P/N 45506-1	93	5580	0,45	0,99	1,50	2,07	2,60	3,11	3,62	4,20	4,70
	112	6720	-	0,48	0,96	1,44	1,93	2,40	2,90	3,34	3,90

* Air flow rates are estimates only.

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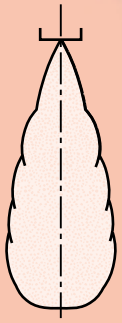

CAPACITY CHARTS (CONT.)

56 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	1,0	1,31	1,65	1,99	2,27	2,61	2,89	3,23	3,51
	22	1320	1,24	1,58	1,93	2,27	2,61	2,96	3,30	3,65	3,99
	26	1560	1,40	1,79	2,20	2,54	2,89	3,30	3,71	4,06	4,47
Right	30	1800	1,58	2,00	2,41	2,82	3,23	3,65	4,06	4,47	4,81
Angle	34	2040	1,72	2,20	2,68	3,09	3,51	3,92	4,40	4,81	5,23
	37	2220	2,00	2,41	2,89	3,37	3,78	4,27	4,68	5,16	5,57
P/N 31618-1	41	2460	2,2	2,68	3,16	3,64	4,13	4,54	5,02	5,43	5,91
	45	2700	2,48	2,96	3,44	3,92	4,40	4,81	5,30	5,78	6,26
	49	2940	2,75	3,23	3,78	4,19	4,68	5,23	5,71	6,19	6,67
	53	3180	3,03	3,51	4,06	4,54	5,02	5,57	6,05	6,60	7,08
	56	3360	3,30	3,85	4,40	4,88	5,43	6,05	6,50	7,02	7,50

56 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	0,93	1,36	1,78	2,21	2,63	3,06	3,48	3,91	4,33
	22	1320	0,85	1,27	1,70	2,10	2,52	2,92	3,34	3,77	4,16
	26	1560	0,76	1,19	1,56	1,98	2,41	2,83	3,23	3,65	4,05
Right	30	1800	0,68	1,08	1,47	1,90	2,29	2,69	3,09	3,48	3,88
Angle	34	2040	0,59	1,12	1,39	1,76	2,12	2,52	2,89	3,28	3,65
	37	2220	0,54	0,91	1,27	1,64	1,98	2,35	2,69	3,06	3,43
P/N 31618-1	41	2460	0,48	0,82	1,19	1,53	1,87	2,21	2,55	2,89	3,23
	45	2700	0,42	0,76	1,10	1,42	1,76	2,07	2,41	2,75	3,06
	49	2940	0,37	0,71	1,02	1,33	1,67	1,98	2,32	2,63	2,94
	53	3180	0,31	0,63	0,96	1,27	1,56	1,90	2,21	2,52	2,86
	56	3360	0,25	0,57	0,88	1,19	1,47	1,76	2,07	2,38	2,66

56 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	1,03	1,31	1,65	1,93	2,27	2,54	2,89	3,16	3,51
	22	1320	1,24	1,58	1,93	2,20	2,54	2,82	3,16	3,51	3,78
	26	1560	1,44	1,86	2,20	2,54	2,89	3,16	3,58	3,92	4,76
	30	1800	1,65	2,07	2,48	2,82	3,23	3,51	3,99	4,33	4,68
In-Line	34	2040	1,86	2,27	2,75	3,16	3,51	3,85	4,33	4,68	5,16
	37	2220	1,99	2,54	3,03	3,44	3,85	4,26	4,61	5,09	5,50
P/N 32555-1	41	2460	2,27	2,82	3,30	3,71	4,19	4,61	5,02	5,50	5,91
	45	2700	2,48	3,09	3,58	4,06	4,54	4,95	5,64	6,12	6,6
	49	2940	2,75	3,30	3,85	4,33	4,81	5,30	5,85	6,40	7,0
	53	3180	3,03	3,58	4,13	4,68	5,16	5,64	6,26	6,74	7,30
	56	3360	3,30	3,85	4,47	5,02	5,64	6,18	6,74	7,29	7,84

56 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	19	1140	0,99	1,42	1,84	2,27	2,72	3,14	3,57	3,99	4,42
	22	1320	0,91	1,36	1,78	2,21	2,66	3,11	3,48	3,94	4,36
	26	1560	0,82	1,25	1,64	2,09	2,55	2,97	3,40	3,82	4,28
	30	1800	0,74	1,16	1,56	1,98	2,41	2,80	3,23	3,62	4,05
In-Line	34	2040	0,65	1,08	1,47	1,87	2,27	2,66	3,06	3,45	3,88
	37	2220	0,59	0,96	1,36	1,76	2,15	2,52	2,92	3,31	3,68
P/N 32555-1	41	2460	0,54	0,91	1,27	1,64	2,04	2,41	2,76	3,14	3,51
	45	2700	0,48	0,82	1,19	1,56	1,90	2,27	2,63	2,97	3,34
	49	2940	0,42	0,76	1,10	1,44	1,78	2,15	2,49	2,83	3,17
	53	3180	0,37	0,68	1,02	1,36	1,70	2,04	2,38	2,69	2,03
	56	3360	0,31	0,62	0,92	1,27	1,59	1,93	2,24	2,58	2,89

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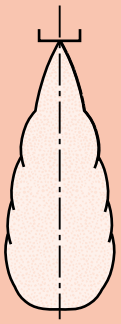

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CAPACITY CHARTS (CONT.)

37 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	7,6	454	,70	1,0	1,3	1,6	1,9	2,1	2,5	2,8	3,0
	11,3	681	1,0	1,4	1,7	2,0	2,4	2,7	3,0	3,4	3,7
	15	900	1,3	1,7	2,1	2,5	2,9	3,2	3,6	4,0	4,4
Right	19	1140	1,65	2,1	2,5	3,0	3,4	3,8	4,2	4,6	5,0
Angle	22	1320	2,0	2,5	3,0	3,5	3,9	4,3	4,7	5,2	5,6
	26	1560	2,4	3,0	3,5	4,0	4,4	4,8	5,3	5,8	6,3
P/N 31325-1	30	1800	2,9	3,5	4,0	4,5	5,0	5,4	6,0	6,5	7,0
	34	2040	3,4	3,9	4,5	5,0	5,6	6,1	6,6	7,2	7,7
	37	2220	3,9	4,5	5,0	5,6	6,1	6,7	7,2	7,8	8,3

37 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	7,6	454	0,62	0,88	1,1	1,3	1,6	1.8	2,1	2,3	2,6
	11,3	681	0,54	0,79	1,1	1,3	1,5	1.8	2,0	2,2	2,4
	15	900	0,45	0,70	0,96	1,2	1,4	1.6	1,8	2,1	2,3
Right	19	1140	0,40	0,59	0,85	1,1	1,3	1.5	1,8	2,0	2,3
Angle	22	1320	0,31	0,54	0,74	0,96	1,2	1,4	1,6	1,9	2,1
	26	1560	0,25	0,45	0,68	0,88	1,1	1,3	1,5	1,7	1,9
P/N 31325-1	30	1800	0,20	0,40	0,59	0,79	0,99	1,2	1,4	1,6	1,8
	34	2040	0,14	0,31	0,51	0,71	0,91	1,1	1,3	1,5	1,7
	37	2220	0,06	0,25	0,42	0,62	0,79	1,0	1,2	1,4	1,6

37 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	7,6	454	0,7	0,97	1,2	1,5	1,8	2,0	2,3	2,5	2,8
	11,3	681	1,0	1,4	1,7	2,0	2,3	2,6	2,9	3,2	3,5
	15	900	1,4	1,8	2,1	2,5	2,9	3,2	3,6	4,0	4,3
	19	1140	1,7	2,1	2,6	3,0	3,4	3,7	4,2	4,5	4,8
In-Line	22	1320	2,0	2,6	3,1	3,5	3,9	4,3	4,7	5,2	5,6
	26	1560	2,5	3,0	3,5	4,1	4,5	4,9	5,4	5,8	6,3
P/N 32554-1	30	1800	3,0	3,5	4,1	4,6	5,1	5,5	6,0	6,5	7,0
	34	2040	3,5	4,1	4,7	5,2	5,7	6,2	6,8	7,3	7,8
	37	2220	4,0	4,7	5,2	5,8	6,3	6,8	7,4	7,9	8,5

37 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	7,6	454	0,65	0,88	1,1	1,4	1,6	1,8	2,0	2,3	2,5
	11,3	681	0,57	0,82	1,1	1,3	1,5	1,8	2,0	2,2	2,4
	15	900	0,51	0,74	1,0	1,3	1,5	1,7	1,9	2,2	2,4
	19	1140	0,42	0,68	0,93	1,2	1,4	1,6	1,9	2,1	2,4
In-Line	22	1320	0,37	0,59	0,82	1,1	1,3	1,5	1,8	2,0	2,3
	26	1560	0,28	0,51	0,74	0,96	1,2	1,4	1,6	1,9	2,1
P/N 32554-1	30	1800	0,23	0,45	0,65	0,85	1,1	1,3	1,5	1,8	2,0
	34	2040	0,17	0,37	0,57	0,76	0,99	1,2	1,4	1,6	1,8
	37	2220	0,09	0,31	0,51	0,71	0,91	1,1	1,3	1,5	1,7

15 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	0,6	1,0	1,4	1,8	2,2	2,5	3,0	3,4	3,8
	1,93	114	0,7	1,1	1,6	2,0	2,4	2,8	3,2	3,7	4,1
Right	2,5	150	0,8	1,2	1,7	2,1	2,6	3,0	3,4	3,9	4,3
Angle	3,8	228	1,0	1,4	1,9	2,4	2,9	3,4	3,9	4,3	4,8
	7,6	454	1,4	1,9	2,5	3,1	3,7	4,1	4,7	5,3	5,9
P/N 31693-1	11,3	681	1,7	2,3	2,9	3,5	4,1	4,7	5,4	6,0	6,5
	13,25	795	1,9	2,5	3,1	3,7	4,3	5,0	5,6	6,2	6,8
	15	900	2,0	2,7	3,3	3,9	4,6	5,2	5,8	6,5	7,1

15 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	0,33	0,45	0,57	0,68	0,79	0,91	1,0	1,1	1,3
	1,93	114	0,31	0,42	0,54	0,65	0,76	0,88	0,99	1,1	1,2
Right	2,5	150	0,28	0,40	0,51	0,62	0,74	0,85	0,96	1,1	1,2
Angle	3,8	228	0,24	0,37	0,45	0,57	0,68	0,80	0,91	1,0	1,1
	7,6	454	0,14	0,23	0,31	0,42	0,51	0,62	0,74	0,82	0,93
P/N 31693-1	11,3	681	0,03	0,14	0,20	0,28	0,37	0,45	0,54	0,62	0,63
	13,25	795	-	0,09	0,17	0,23	0,31	0,40	0,45	0,54	0,62
	15	900	-	0,06	0,14	0,20	0,25	0,34	0,40	0,48	0,54

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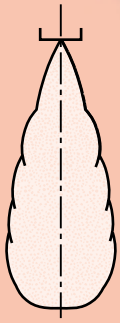

CAPACITY CHARTS (CONT.)

15 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	45	0,65	1,00	1,44	1,86	2,20	2,61	3,09	3,50	3,92
	1,89	113	0,79	1,24	1,65	2,06	2,48	2,89	3,37	3,78	4,20
	2,50	150	0,89	1,30	1,72	2,20	2,61	3,09	3,51	3,99	4,40
In-Line	3,78	227	1,17	1,65	2,20	2,61	3,09	3,68	4,06	4,54	5,02
	7,57	455	1,92	2,48	3,09	3,65	4,20	4,75	5,30	5,84	6,40
P/N 32668-1	11,35	681	2,89	3,50	4,10	4,75	5,36	5,91	6,53	7,15	7,77
	13,24	795	3,50	4,10	4,75	5,40	5,98	6,60	7,22	7,91	8,53
	15,13	908	4,10	4,80	5,43	6,05	6,67	7,29	7,98	8,60	9,28

15 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	0,34	0,45	0,59	0,71	0,82	0,96	1,08	1,19	1,33
	1,89	113	0,31	0,44	0,57	0,68	0,79	0,93	1,05	1,16	1,30
	2,50	150	0,30	0,41	0,54	0,65	0,76	0,91	1,02	1,13	1,27
In-Line	3,78	227	0,25	0,37	0,48	0,59	0,71	0,85	0,96	1,08	1,19
	7,57	455	0,14	0,23	0,31	0,42	0,54	0,62	0,74	0,85	0,93
P/N 32668-1	11,35	681	0,028	0,14	0,20	0,28	0,37	0,45	0,54	0,62	0,71
	13,24	795	-	0,085	0,17	0,23	0,31	0,40	0,45	0,54	0,62
	15,13	908	-	0,028	0,14	0,20	0,25	0,34	0,40	0,48	0,57

9,5 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	,76	1,24	1,72	2,13	2,61	3,03	3,50	3,99	4,47
	1,89	113	,89	1,38	1,86	2,34	2,82	3,30	3,71	4,20	4,68
Right	2,50	150	,96	1,51	1,99	2,48	2,96	3,44	3,92	4,40	5,09
Angle	3,78	227	1,10	1,65	2,20	2,75	3,30	3,78	4,33	4,88	5,43
	5,67	340	1,24	1,93	2,48	3,03	3,58	4,10	4,75	5,30	5,91
P/N 31694-1	7,57	455	1,38	2,06	2,68	3,30	3,92	4,47	5,16	5,78	6,4
	9,46	568	1,51	2,20	2,82	3,50	4,13	4,75	5,36	6,05	6,67

9,5 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	,18	,25	,33	,40	,47	,54	,61	,68	,75
	1,89	113	,17	,23	,30	,37	,44	,52	,58	,65	,72
Right	2,50	150	,14	,21	,28	,35	,42	,50	,57	,64	,71
Angle	3,78	227	,11	,18	,24	,31	,37	,44	,51	,57	,64
	5,67	340	,07	,13	,18	,25	,31	,37	,42	,50	,55
P/N 31694-1	7,57	455	-	,057	,11	,17	,23	,28	,33	,40	,45
	9,46	568	-	,042	,085	,13	,17	,20	,25	,31	,34

9,5 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	,69	1,17	1,58	1,99	2,40	2,82	3,23	3,65	4,06
	1,89	113	,83	1,31	1,79	2,27	2,68	3,09	3,44	4,06	4,47
	2,50	150	,96	1,38	1,86	2,41	2,89	3,30	3,65	4,26	4,75
In-Line	3,78	227	1,10	1,65	2,70	2,68	3,23	3,71	4,19	4,75	5,23
	5,67	340	1,31	1,93	2,48	3,09	3,65	4,13	4,8	5,36	5,92
P/N 32740-1	7,57	455	1,44	2,06	2,68	3,30	3,92	4,54	5,16	5,71	6,33
	9,46	568	1,58	2,20	2,89	3,50	4,13	4,8	5,43	6,05	6,67

9,5 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	1,25	75	,17	,24	,31	,37	,44	,51	,58	,65	,71
	1,89	113	,14	,21	,28	,35	,42	,48	,55	,62	,68
	2,50	150	,13	,20	,27	,33	,40	,47	,54	,59	,65
In-Line	3,78	227	-	,16	,21	,28	,35	,41	,48	,54	,59
	5,67	340	-	-	,16	,21	,28	,33	,40	,45	,51
P/N 32740-1	7,57	455	-	-	-	,16	,21	,27	,31	,37	,42
	9,46	568	-	-	-	-	,16	,21	,23	,28	,34

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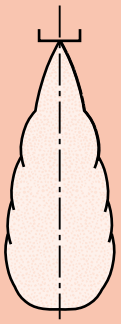

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CAPACITY CHARTS (CONT.)

3,8 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	,76	46	1,17	1,84	2,48	3,11	3,71	4,35	5,02	5,64	6,24
	1,13	68	1,24	1,87	2,53	3,14	3,80	4,46	5,09	5,75	6,39
	1,51	90	1,25	1,91	2,56	3,20	3,87	4,54	5,19	5,86	6,51
Right	1,89	113	1,27	1,93	2,60	3,26	3,92	4,57	5,23	5,90	6,55
Angle	2,27	136	1,28	1,97	2,61	3,29	3,98	4,62	5,31	5,98	6,67
	2,65	159	1,29	1,98	2,64	3,31	3,99	4,68	5,36	6,02	6,68
P/N 32163-2	3,03	182	1,31	1,99	2,65	3,34	4,04	4,72	5,40	6,05	6,74
	3,40	204	1,32	2,00	2,68	3,36	4,06	4,74	5,43	6,09	6,78
	3,78	227	1,33	2,02	2,70	3,37	4,07	4,77	5,45	6,12	6,82

3,8 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	,76	46	,085	,113	,140	,170	,198	,230	,255	,300	,330
	1,13	68	,070	,085	,127	,156	,184	,212	,240	,270	,300
	1,51	90	,057	,080	,113	,127	,156	,184	,212	,240	,270
Right	1,89	113	,042	,070	,085	,113	,140	,170	,198	,212	,240
Angle	2,27	136	,028	,057	,070	,099	,127	,140	,170	,198	,212
	2,65	159	-	,042	,057	,085	,113	,127	,140	,170	,198
P/N 32163-2	3,03	182	-	,034	,051	,070	,085	,113	,127	,140	,170
	3,40	204	-	,028	,042	,057	,079	,099	,113	,127	,156
	3,78	227	-	-	,034	,051	,070	,085	,099	,113	,140

3,8 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	,76	46	1,17	1,86	2,51	3,16	3,78	4,42	5,09	5,71	6,33
	1,13	68	1,20	1,89	2,58	3,23	3,89	4,57	5,21	5,81	6,57
	1,51	90	1,24	1,93	2,61	3,27	3,92	4,59	5,26	5,91	6,60
	1,89	113	1,27	1,96	2,65	3,30	3,99	4,66	5,33	5,98	6,67
In-Line	2,27	136	1,31	1,99	2,68	3,34	4,00	4,68	5,36	6,02	6,71
	2,65	159	1,32	2,00	2,70	3,36	4,02	4,71	5,40	6,07	6,74
P/N 32740-4	3,03	182	1,33	2,02	2,71	3,37	4,03	4,73	5,43	6,08	6,77
	3,40	204	1,35	2,04	2,74	3,38	4,06	4,75	5,45	6,09	6,78
	3,78	227	1,36	2,05	2,75	3,40	4,09	4,76	5,46	6,12	6,81

3,8 LPM	LIQUID FLOW		AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)								
	LPM	LPH	1,4	2,0	2,8	3,5	4,1	4,9	5,5	6,2	7,0
	,76	46	,085	,099	,130	,155	,169	,212	,240	,270	,297
	1,13	68	,070	,085	,099	,127	,155	,184	,212	,230	,250
	1,51	90	,057	,070	,085	,113	,142	,155	,184	,198	,230
	1,89	113	,028	,057	,070	,097	,113	,142	,155	,184	,198
In-Line	2,27	136	,022	,042	,057	.085	,097	,127	,142	,169	,192
	2,65	159	-	,033	,051	,070	,091	,113	,127	,142	,155
P/N 32740-4	3,03	182	-	,028	,042	,062	,085	,097	,113	,127	,142
	3,40	204	-	-	,033	,057	,070	,085	,097	,113	,127
	3,78	227	-	-	,028	,042	,057	,070	,085	,097	,113

0,8 LPM	LIQUID FLOW		LIQUID PRESSURE (Bar.G.) at these Air Pressures (Bar.G.)						AIR FLOW (M^3 PER MIN) at these Air Pressures (Bar.G.)					
	LPM	LPH	3,5	4,1	4,9	5,5	6,2	7,0	3,5	4,1	4,9	5,5	6,2	7,0
	,063	3,8	,52	,65	,79	,93	1,07	1,20	,085	,099	,113	,127	,142	,155
	,19	11	,62	,79	,93	1,07	1,20	1,34	,085	,099	,113	,127	,142	,155
	,38	23	,89	1,10	1,31	1,48	1,65	1,86	,085	,099	,113	,127	,142	,155
Right	,57	34	1,13	1,38	1,62	1,86	2,06	2,30	,085	,099	,113	,127	,142	,142
Angle	,76	46	1,41	1,69	1,96	2,24	2,51	2,79	,085	,099	,107	,113	,127	,142
	1,14	68	1,72	2,03	2,34	2,65	2,96	3,27	,085	,093	,099	,113	,127	,127
P/N 32163-1	1,89	113	2,27	2,68	3,06	3,47	3,88	4,26	,085	,085	,099	,102	,113	,127
	2,65	159	2,68	3,20	3,71	4,20	4,68	5,16	,070	,085	,099	,102	,113	,127
	3,40	204	3,23	3,85	4,40	4,95	5,50	6,12	,070	,079	,085	,099	,102	,113
	3,78	227	3,51	4,13	4,75	5,36	5,98	6,60	,065	,070	,085	,091	,099	,113

---------- *Maximum Recommended Flow*

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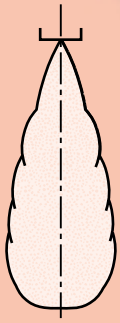
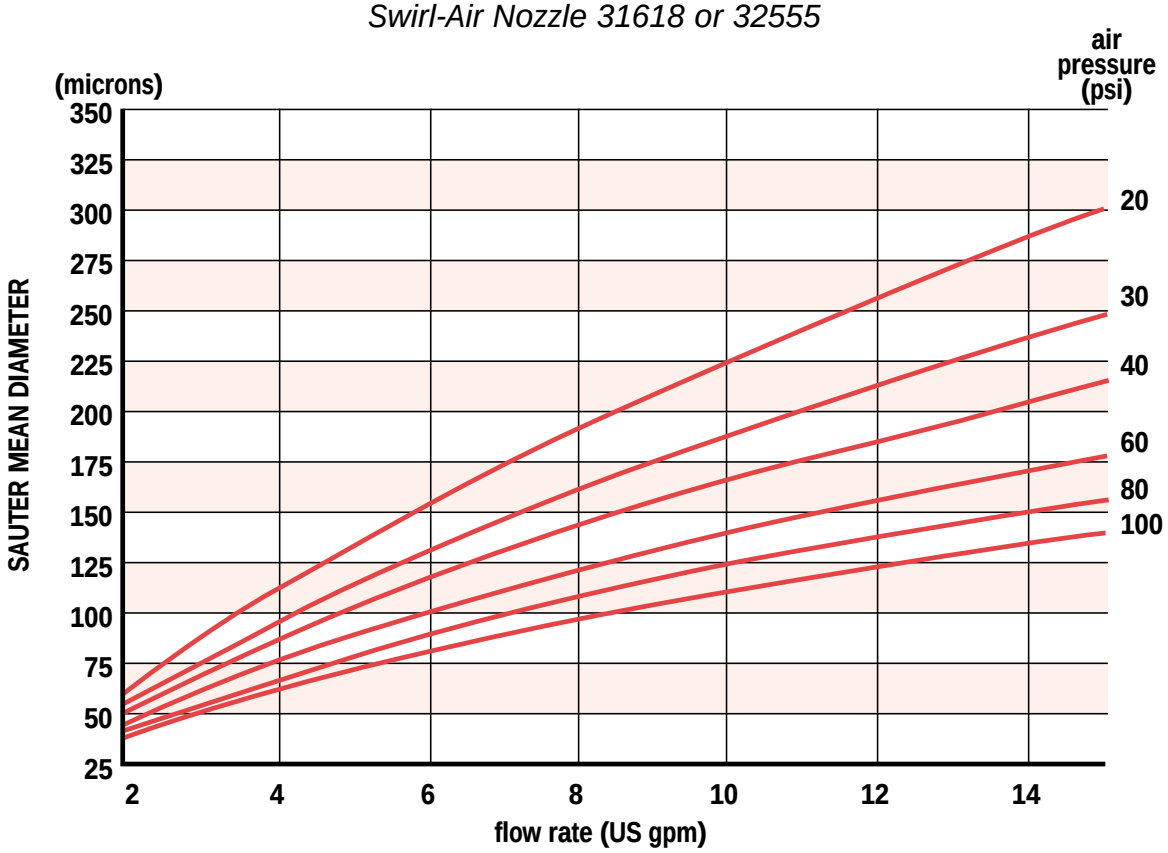
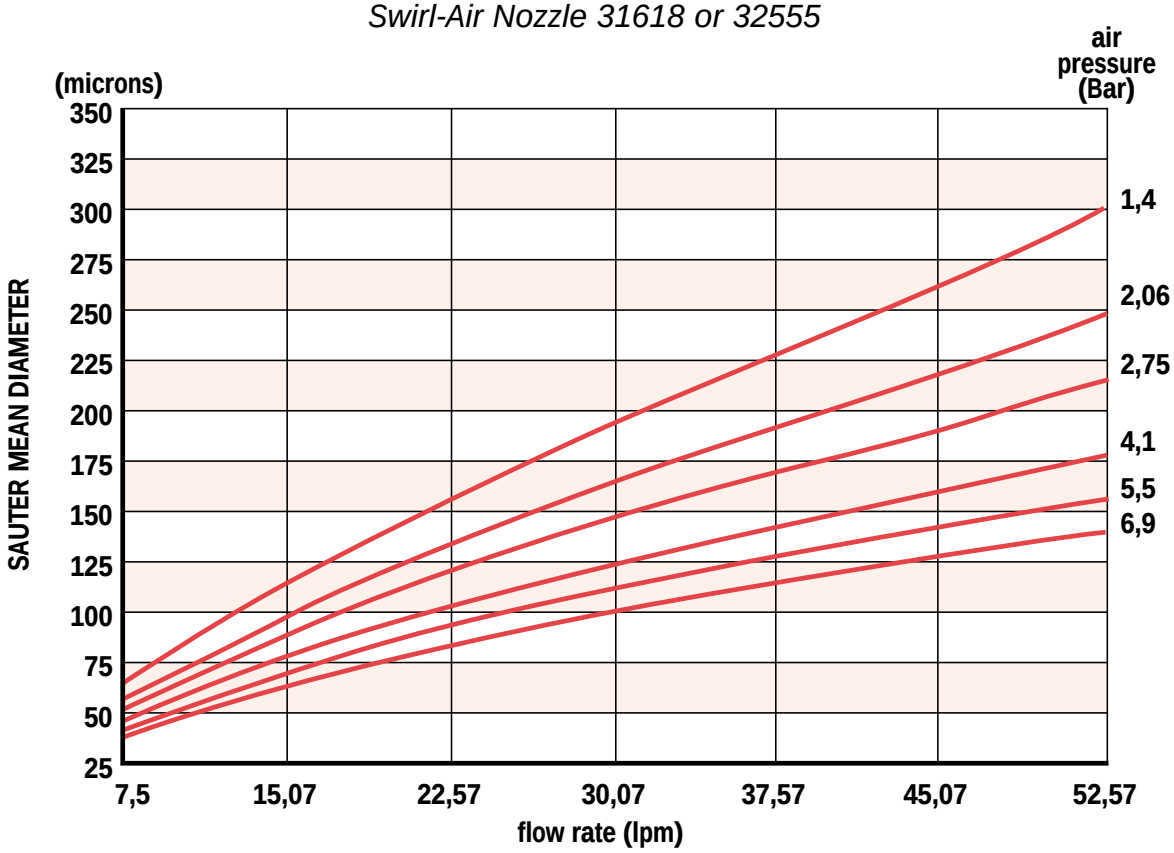


Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 31618 or 32555



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 31618 or 32555



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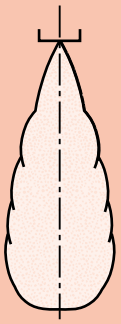

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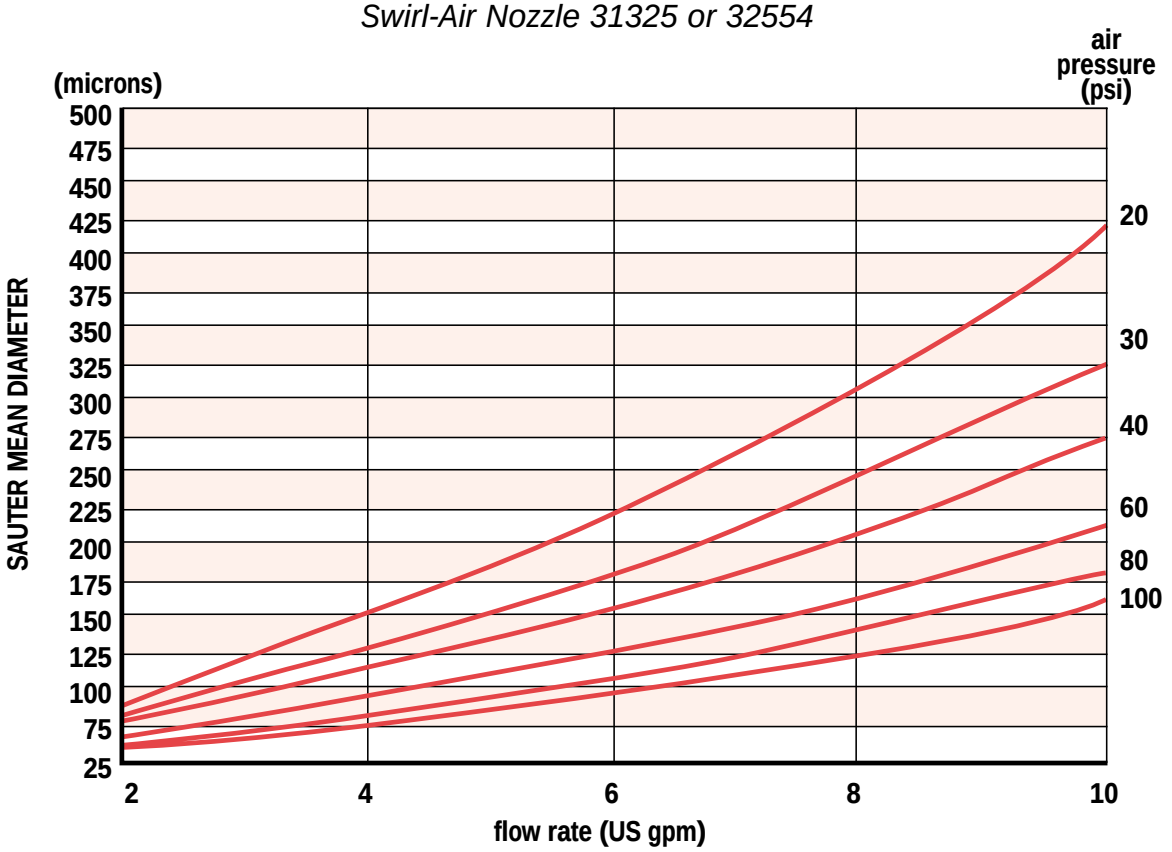
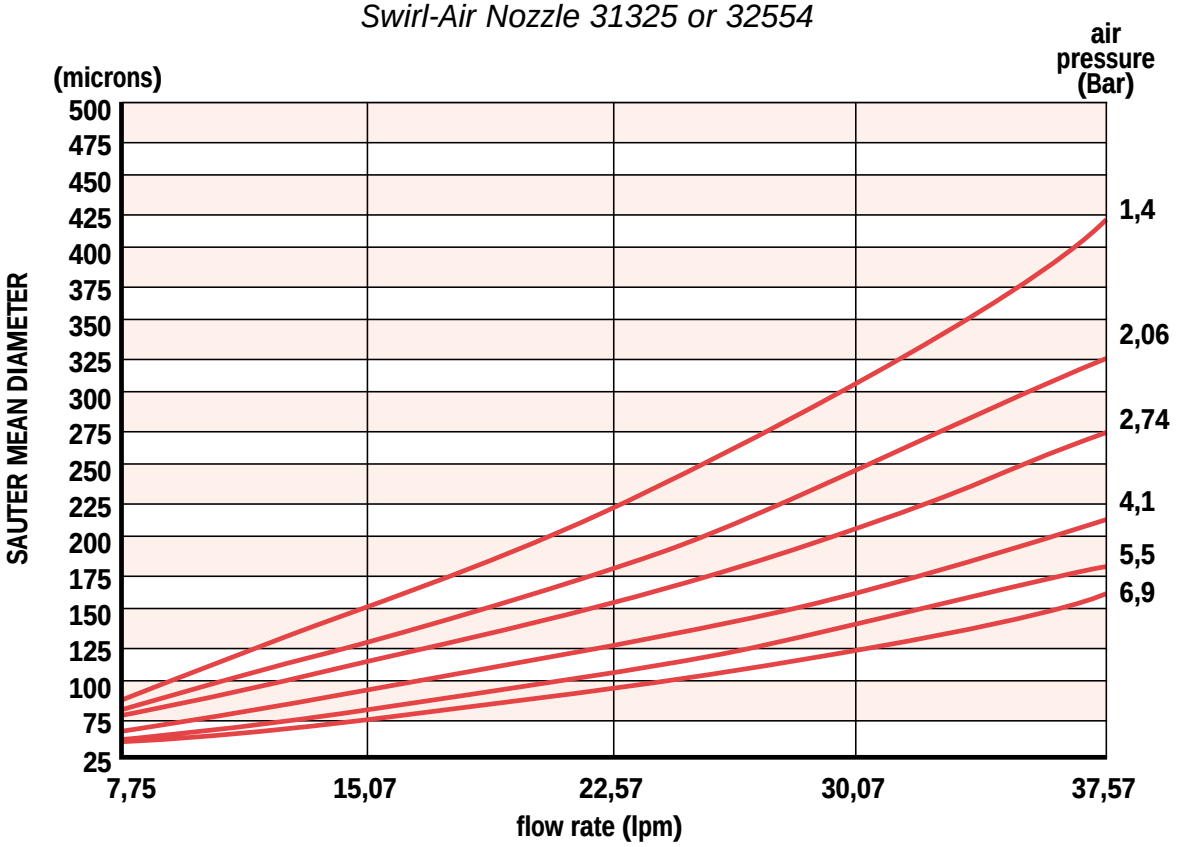
Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 31325 or 32554



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 31325 or 32554



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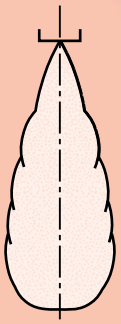
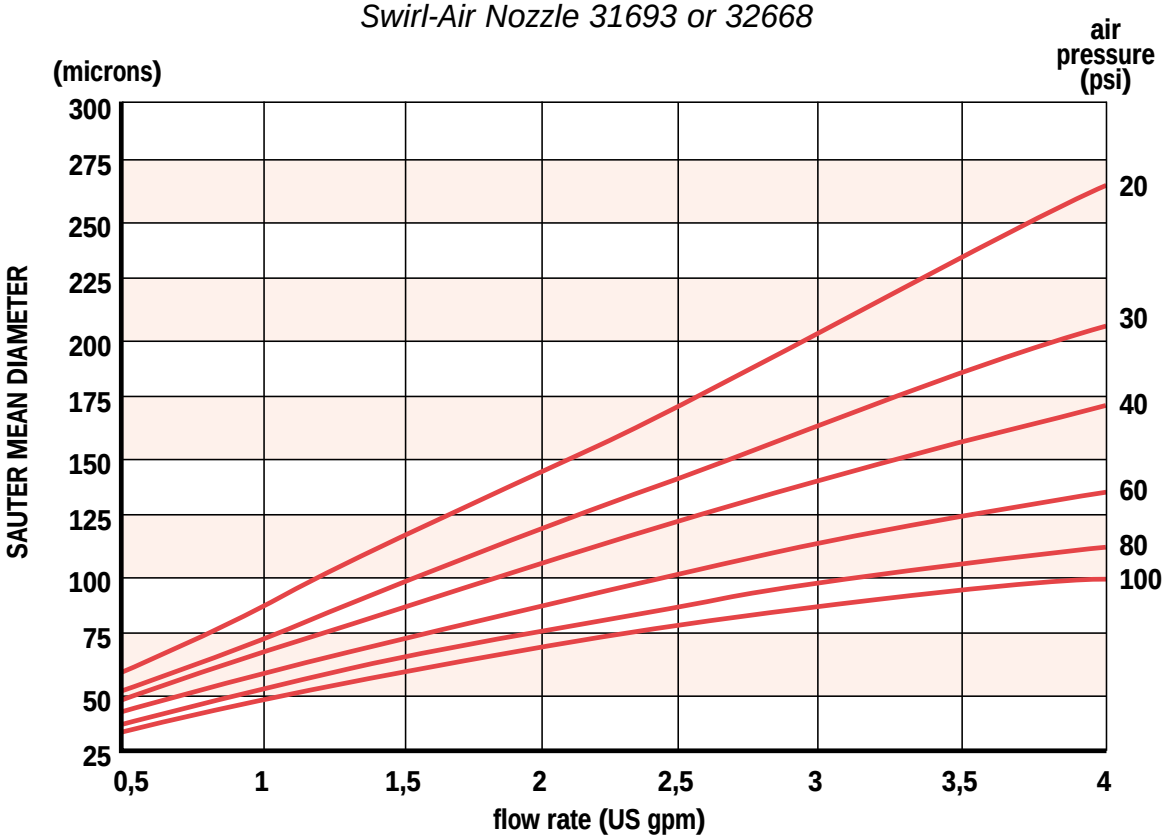
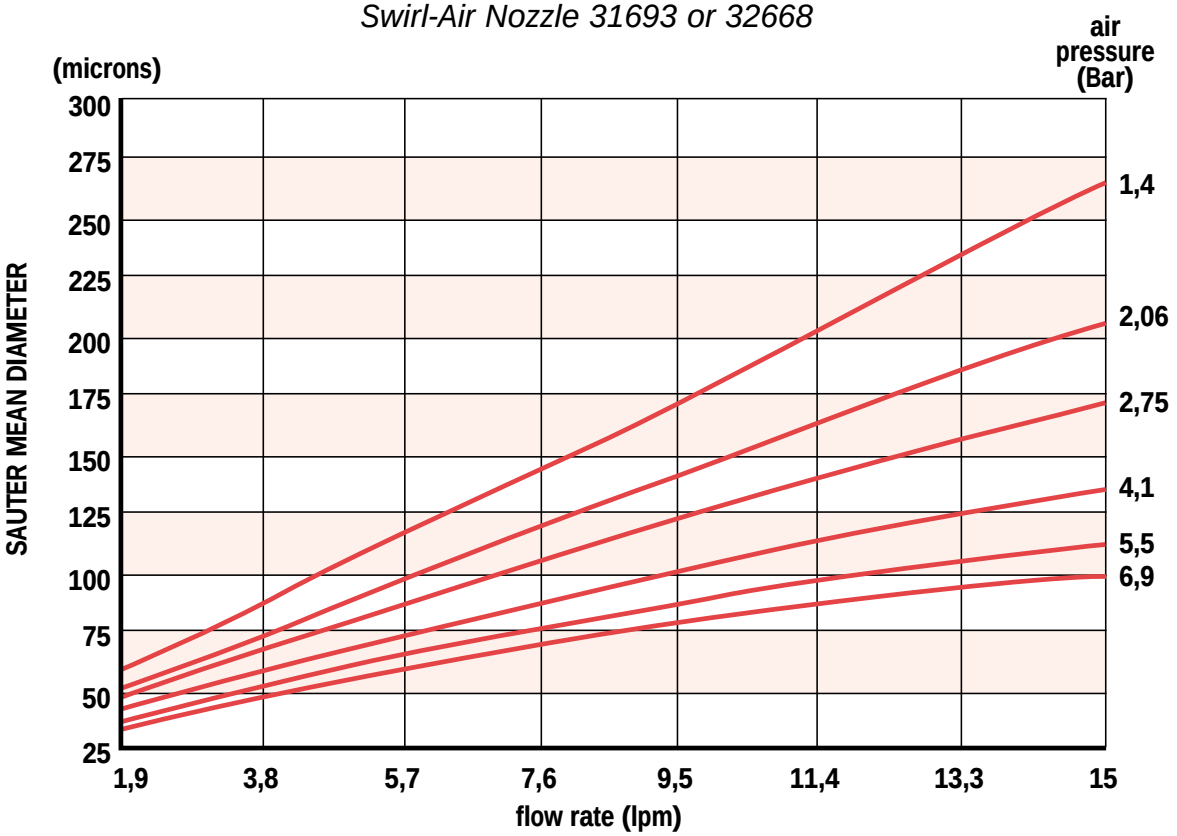


Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 31693 or 32668



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 31693 or 32668



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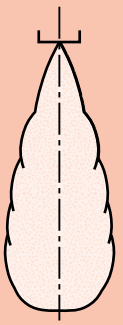

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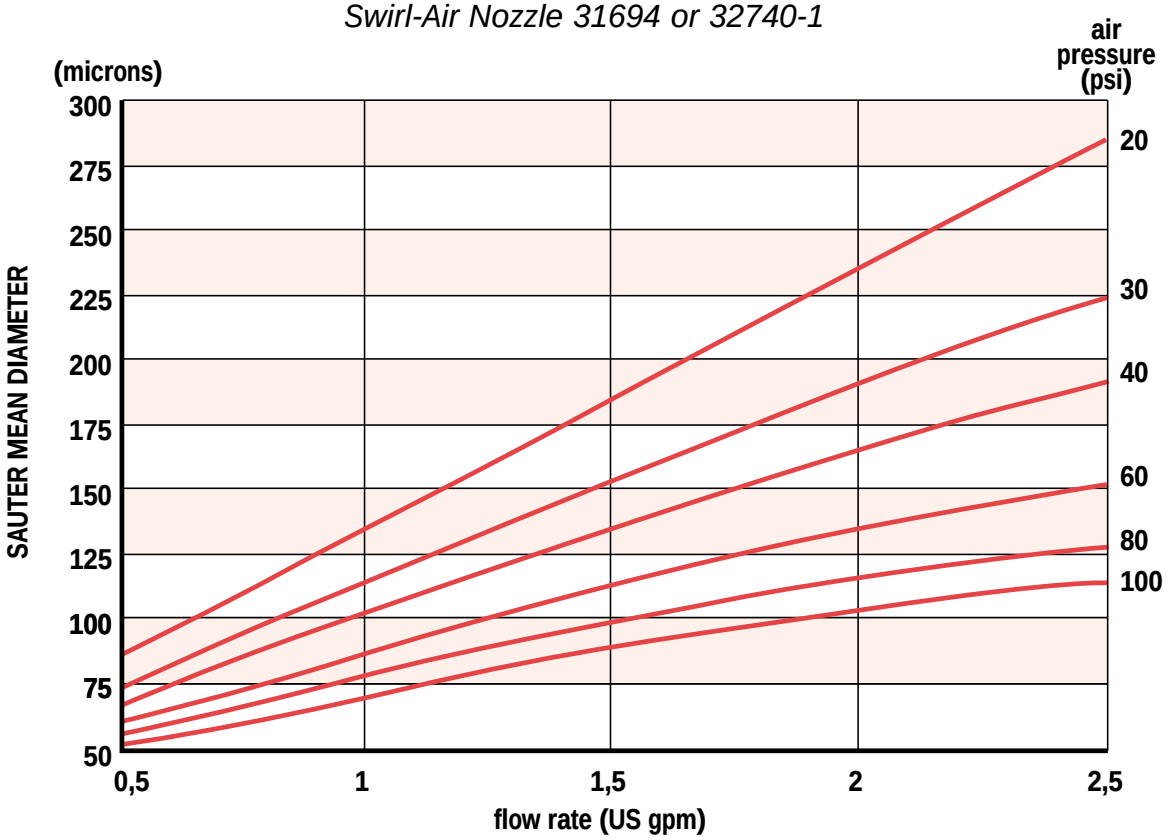
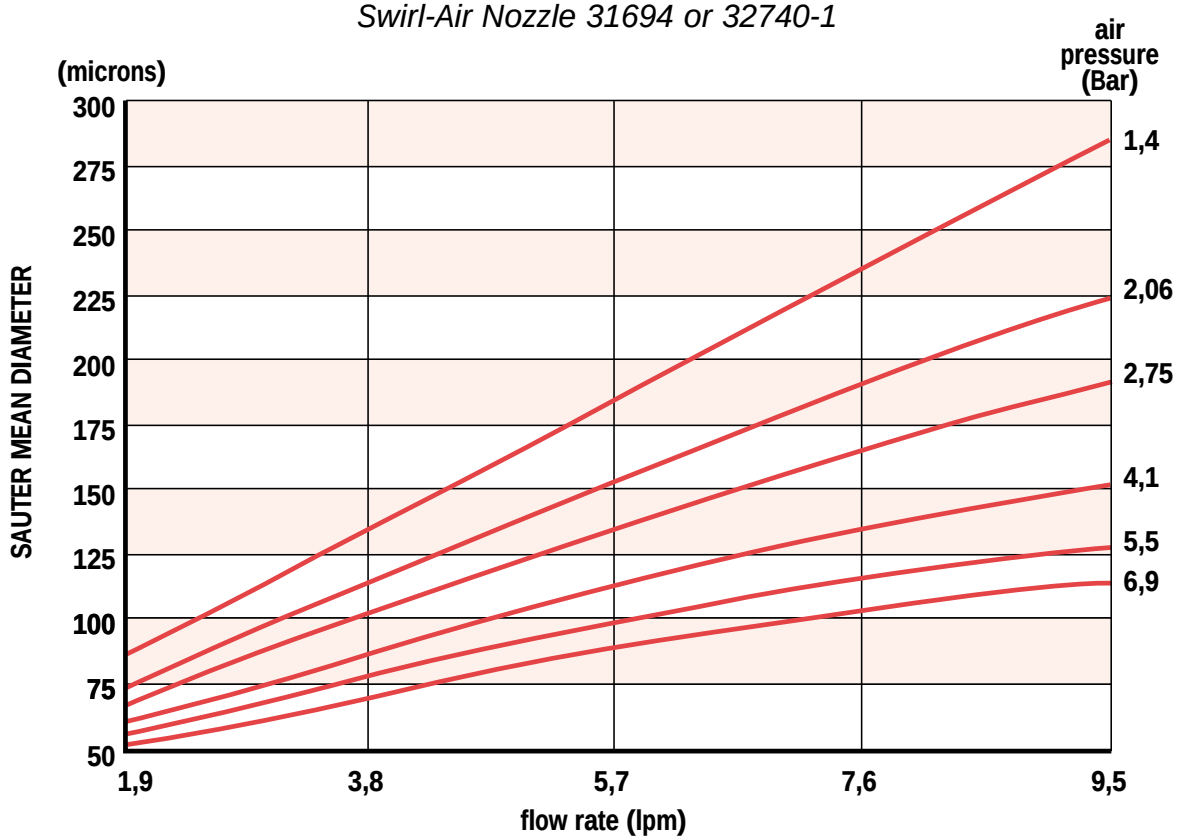
Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 31694 or 32740-1



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 31694 or 32740-1



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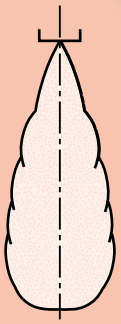
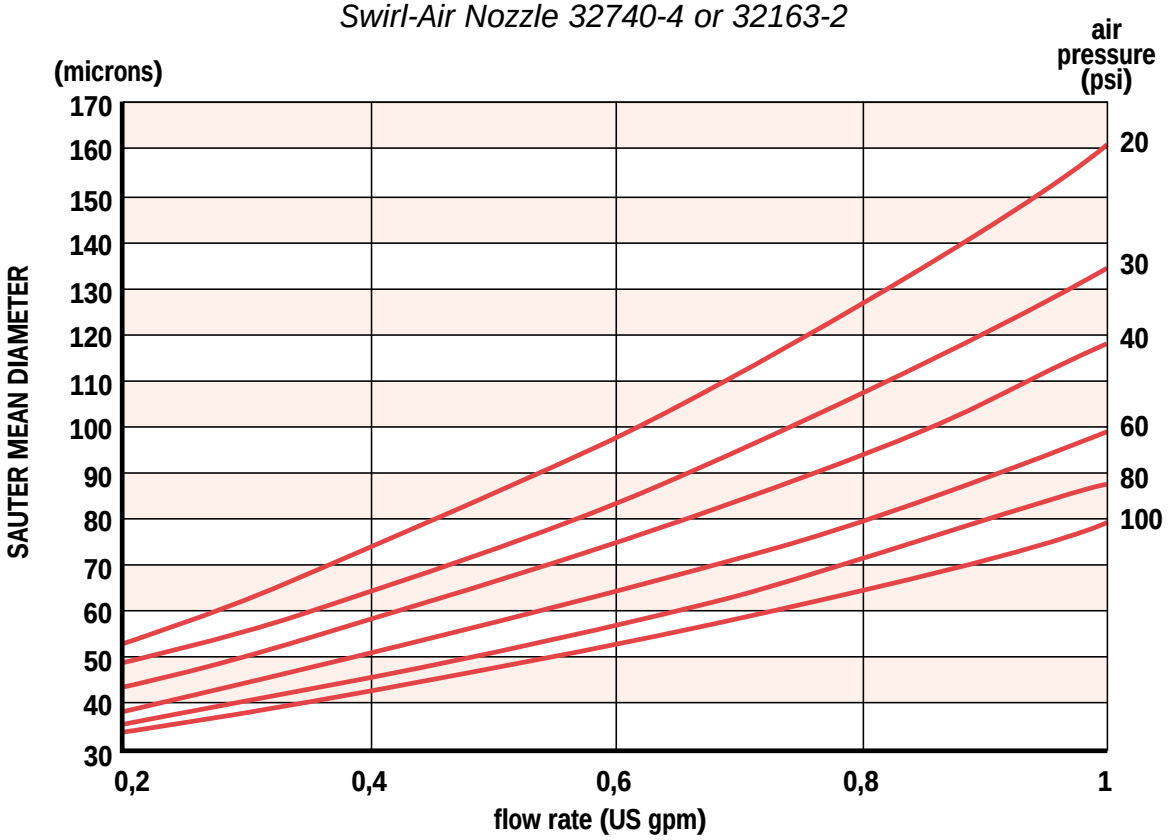
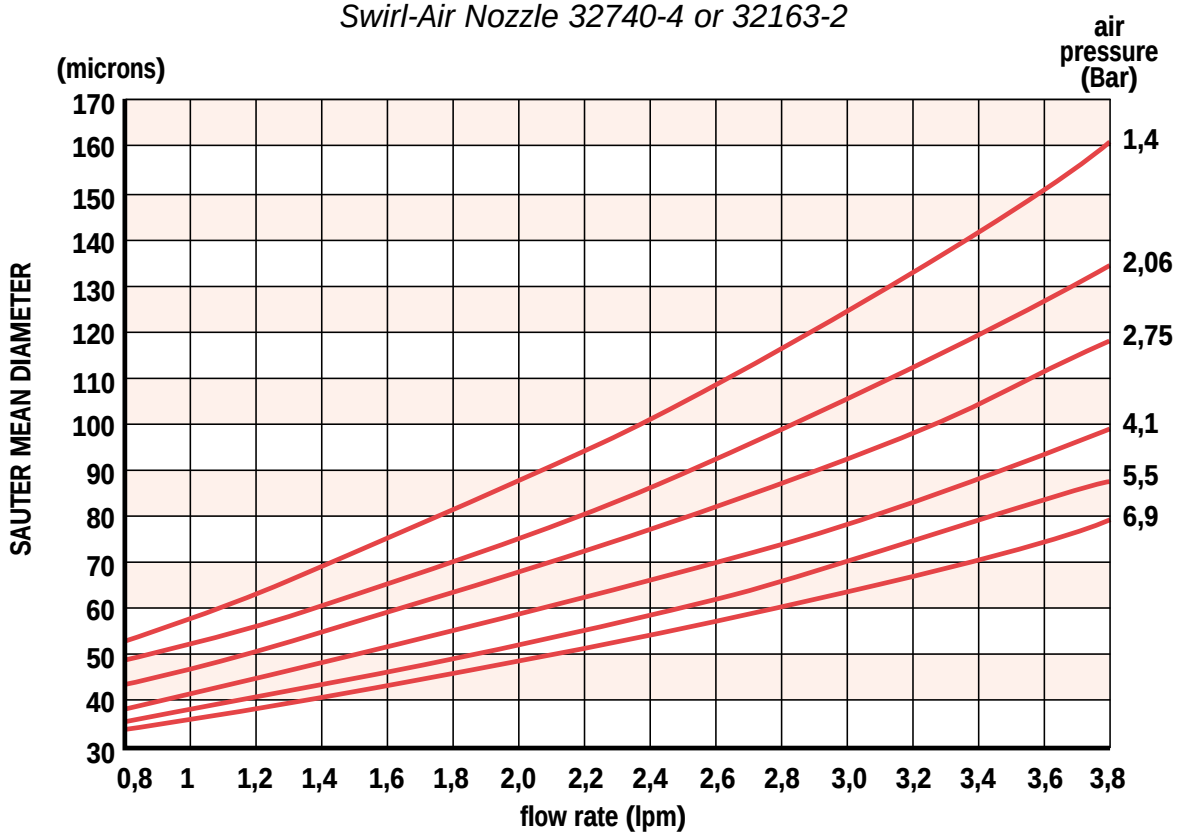


Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 32740-4 or 32163-2



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 32740-4 or 32163-2



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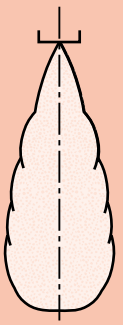

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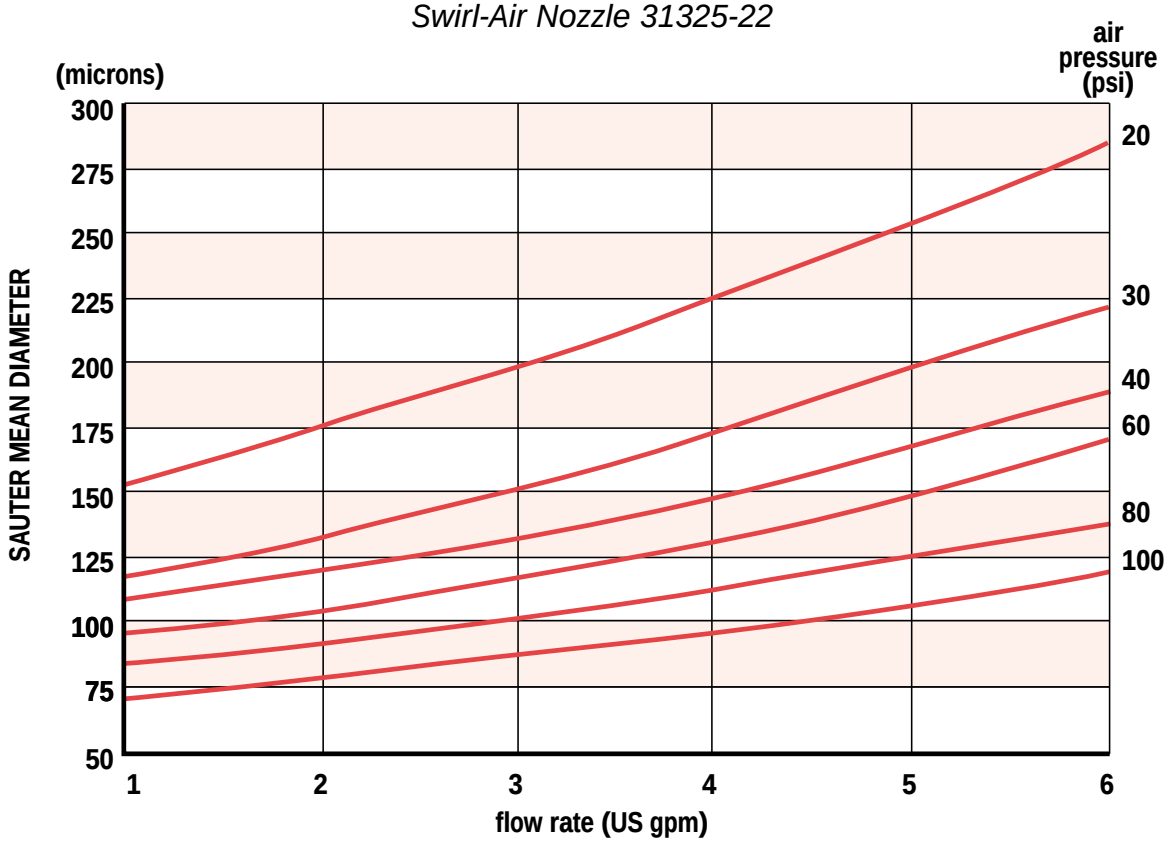
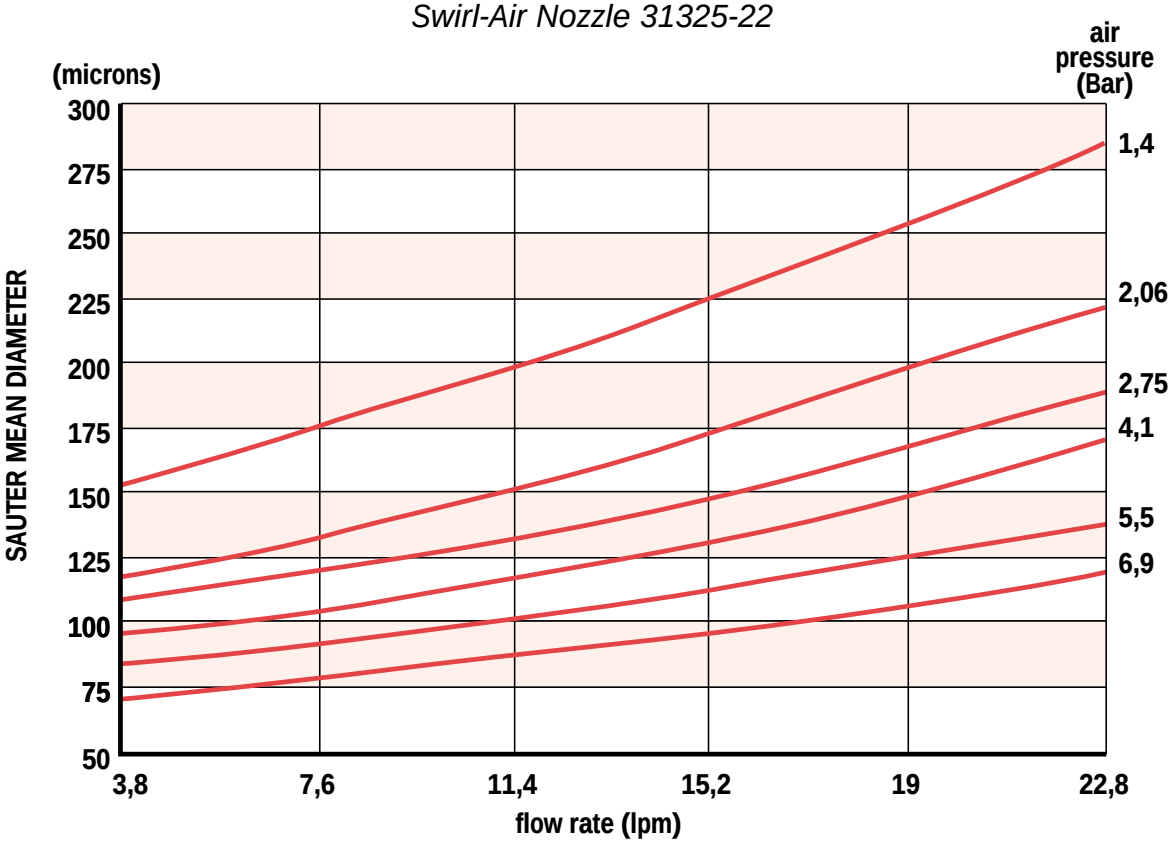
Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - US Measures
Swirl-Air Nozzle 31325-22



Estimated Sauter Mean Droplet Diameters
Flow/Droplet Diameters - Metric Measures
Swirl-Air Nozzle 31325-22



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