



# Notes!

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## FLOW OF AIR THROUGH SCHEDULE 40 STEEL PIPE

Free Air $q'$ ft <sup>3</sup> /min. at 60°F & 14.7 psia	Compressed Air ft <sup>3</sup> /min. at 60°F at 100 psig	Pressure Drop per 100' of Schedule 40 Pipe For Air For 60° and 100 Pounds Per Square Inch (PSI)									
		<b>1/8"</b>	<b>1/4"</b>	<b>3/8"</b>	<b>1/2"</b>						
1	0.128	0.361	0.083	0.018							
2	0.256	1.31	0.285	0.064	0.020						
3	0.384	3.06	0.605	0.133	0.042	<b>3/4"</b>					
4	0.513	4.83	1.04	0.226	0.071						
5	0.641	7.45	1.58	0.343	0.106	0.027					
6	0.769	10.6	2.23	0.408	0.148	0.037	<b>1"</b>	<b>1 1/4"</b>			
8	1.025	18.6	3.89	0.848	0.255	0.062	0.019				
10	1.282	28.7	5.96	1.26	0.356	0.094	0.029			<b>1 1/2"</b>	
15	1.922		1 3.0	2.73	0.834	0.201	0.062				
20	2.563		2 2.8	4.76	1.43	0.345	0.102	0.026			
25	3.204		3 5.6	7.34	2.21	0.526	0.156	0.039	0.019		
30	3.845		1	0.5	3.15	0.748	0.219	0.055	0.026		
35	4.486		1	4.2	4.24	1.00	0.293	0.073	0.035		
40	5.126		1	8.4	5.49	1.30	0.379	0.095	0.044		
45	5.767		2	3.1	6.90	1.62	0.474	0.116	0.055		<b>2"</b>
50	6.408		2	8.5	8.49	1.99	0.578	0.149	0.067	0.019	
60	7.690	<b>2 1/2"</b>	4	0.7	12.2	2.85	0.819	0.200	0.094	0.027	
70	8.971		1		6.5	3.83	1.10	0.270	0.126	0.036	
80	10.25	0.019			21.4	4.96	1.43	0.350	0.162	0.046	
90	11.53	0.023			27.0	6.25	1.80	0.437	0.203	0.058	

# Water Flow Data

## FLOW OF WATER THROUGH SCHEDULE 40 STEEL PIPE

### Pressure Drop per 100 feet and Velocity in Schedule 40 Pipe for Water at 60° F

Discharge		Pressure Drop per 100 feet and Velocity in Schedule 40 Pipe for Water at 60° F															
		Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.	Velocity feet per Second	Press. Drop Lbs. per Sq. In.
0.2	0.000446	<b>1/8"</b>		<b>1/4"</b>		<b>3/8"</b>		<b>1/2"</b>		<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
		1.13	1.86	0.616	0.359												
0.3	0.000668	1.69	4.22	0.924	0.903	0.504	0.159	0.317	0.061	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
0.4	0.000891	2.26	6.98	1.23	1.61	0.672	0.345	0.422	0.086	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
0.5	0.00111	2.82	10.5	1.54	2.39	0.840	0.539	0.528	0.167	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
0.6	0.00178	3.39	14.7	1.85	3.29	1.01	0.751	0.633	0.240	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
0.8	0.00178	4.52	25.0	2.46	5.44	1.34	1.25	0.844	0.408	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
1	0.00223	5.65	37.2	3.08	8.28	1.68	1.85	1.06	0.600	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
2	0.00446	11.29	134.4	6.16	30.1	3.36	6.58	2.11	2.10	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
3	0.00668			9.25	64.1	5.04	13.9	3.17	4.33	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
4	0.00891			12.33	111.2	6.72	23.9	4.22	7.42	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
5	0.01114					8.40	36.7	5.28	11.2	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
6	0.01337	<b>2"</b>		<b>2 1/2"</b>		10.08	51.9	6.33	15.8	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
8	0.01782	0.574	0.044			13.44	91.1	8.45	27.7	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
10	0.02228	0.765	0.073					4.81	6.60	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
15	0.03342	0.956	0.108	0.670	0.046			6.02	9.99	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
20	0.04456	1.43	0.224	1.01	0.094			9.03	21.6	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
25	0.05570	1.91	0.375	1.34	0.158	0.868	0.056	12.03	37.8	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
30	0.06684	2.39	0.561	1.68	0.234	0.090	0.083	0.812	0.041	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
35	0.07798	2.87	0.786	2.01	0.327	1.30	0.114	0.974	0.056	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
40	0.08912	3.35	1.05	2.35	0.436	1.52	0.151	1.14	0.074	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
45	0.1003	3.83	1.35	2.68	0.556	1.74	0.192	1.30	0.095	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
50	0.1114	4.30	1.67	3.02	0.668	1.95	0.239	1.46	0.117	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
60	0.1337	4.78	2.03	3.35	0.839	2.17	0.288	1.62	0.142	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
70	0.1560	5.74	2.87	4.02	1.18	2.60	0.406	1.95	0.204	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
80	0.1782	6.70	3.84	4.69	1.59	3.04	0.540	2.27	0.261	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
90	0.2005	7.65	4.97	5.36	2.03	3.47	0.687	2.60	0.334	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
100	0.2228	8.60	6.20	6.03	2.53	3.91	0.861	2.92	0.416	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
125	0.2785	9.56	7.59	6.70	3.09	4.34	1.05	3.25	0.509	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
150	0.3342	11.97	11.76	8.38	4.71	5.43	1.61	4.06	0.769	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
175	0.3899	14.36	16.70	10.05	6.69	6.51	2.24	4.87	1.08	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
200	0.4456	16.75	22.3	11.73	8.97	7.60	3.00	5.68	1.44	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
225	0.5013	19.14	28.8	13.42	11.68	8.68	3.87	6.49	1.85	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
250	0.5570	-	-	15.09	14.63	9.77	4.83	7.30	2.32	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
275	0.6127	-	-	-	-	10.85	5.93	8.12	2.84	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
300	0.6684	-	-	-	-	11.94	7.14	8.93	3.40	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
350	0.7798	-	-	-	-	13.00	8.36	9.74	4.02	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
400	0.8912	-	-	-	-	-	-	11.36	5.41	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
450	1.0030	-	-	-	-	-	-	12.98	7.03	<b>3/4"</b>		<b>1"</b>		<b>1 1/4"</b>		<b>1 1/2"</b>	
500	1.114	<b>10"</b>		<b>12"</b>		<b>14"</b>		<b>16"</b>		<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
600	1.337	2.03	0.059					12.60	5.65	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
700	1.560	2.44	0.083					15.12	8.04	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
800	1.782	2.85	0.112	2.01	0.047	<b>14"</b>		-	-	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
900	2.005	3.25	0.143	2.29	0.061	<b>14"</b>		-	-	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
1000	2.228	3.66	0.179	2.58	0.075	<b>14"</b>		2.13	0.047	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
1200	2.674	4.07	0.218	2.87	0.091	<b>14"</b>		2.37	0.057	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
1400	3.119	4.48	0.306	3.44	0.128	<b>14"</b>		2.85	0.080	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
1600	3.119	5.70	0.409	4.01	0.171	<b>14"</b>		3.32	0.107	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
1800	3.565	6.51	0.527	4.59	0.219	<b>14"</b>		3.79	0.138	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
2000	4.010	7.32	0.663	5.16	0.276	<b>14"</b>		4.27	0.172	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	
2000	4.456	8.14	0.808	5.73	0.339	<b>14"</b>		4.74	0.209	<b>18"</b>		<b>20"</b>		<b>22"</b>		<b>24"</b>	



### Valve & Fitting Losses in Expressed in Equivalent Feet of Pipe

Pipe Fitting or Valve	Nominal Pipe or Tube Size (inches)													
	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8
1 90° Standard Elbow	1.4	1.6	2.0	2.6	3.3	4.0	5.0	6.0	7.5	9.0	10	13	16	20
2 45° Standard Elbow	0.7	0.8	0.9	1.3	1.7	2.1	2.6	3.2	4.0	4.7	5.2	6.5	7.9	10
3 Flow-Through Branch Tee	2.7	3.0	4.0	5.0	7.0	8.0	10	12	15	18	21	25	30	40
4 Straight Through Flow Tee - No Reduction	0.9	1.0	1.4	1.7	2.3	2.6	3.3	4.1	5.0	5.9	6.7	8.2	10	13
5 Straight Through Flow Tee - Reduced 1/4	1.2	1.4	1.9	2.3	3.1	3.7	4.7	5.6	7.0	8.0	9.0	12	14	18
6 Straight Through Flow Tee - Reduced 1/8	1.4	1.6	2.0	2.6	3.3	4.0	5.0	6.0	7.5	9.0	10	13	16	20
7 Globe Valve - Fully opened	17	18	22	29	38	43	55	69	84	100	120	140	170	220
8 Gate Valve - Fully opened	0.6	0.7	0.9	1.0	1.5	1.8	2.3	2.8	3.2	4.0	4.5	6.0	7.0	9.0

# Spray Coverage

## SPRAY ANGLE TERMS

Four terms are commonly used to describe spray coverage:

### Spray Angle:

**(A)** The included angle of the spray as measured close to the nozzle orifice. Since the droplets are immediately acted upon by external forces (gravity and moving gases, for example), this measurement is useful only for determining spray coverage close to the nozzle. The spray angles listed for nozzles in this catalog are angles at the nozzle, measured at the nozzle's design pressure, which is highlighted in each chart of flow rate vs. pressure.

### Actual Spray Coverage:

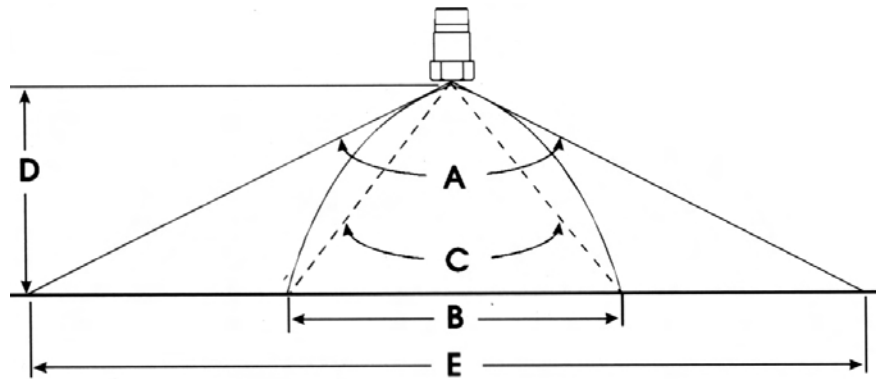
**(B)** The actual coverage at a specified distance **(D)** from the nozzle.

### Effective Spray Angle:

**(C)** The angle calculated from the actual coverage **(B)** at a distance **(D)**.

### Theoretical Spray Coverage:

**(E)** The coverage at distance **(D)** if the spray moved in a straight line.



## THEORETICAL SPRAY COVERAGE (E) IN INCHES

Included Spray Angle (A)	Distance From Nozzle Orifice (D) (inches)										
	2	4	6	8	10	12	15	18	24	30	36
10°	0.4	0.7	1.1	1.4	1.8	2.1	2.6	3.1	4.2	5.2	6.3
20°	0.7	1.4	2.1	2.8	3.5	4.2	5.3	6.4	8.5	10.6	12.7
30°	1.1	2.1	3.2	4.3	5.4	6.4	8.1	9.7	12.8	16.1	19.3
40°	1.5	2.9	4.4	5.8	7.3	8.7	10.9	13.1	17.5	21.8	26.2
50°	1.9	3.7	5.6	7.5	9.3	11.2	14.0	16.8	22.4	28.0	33.6
60°	2.3	4.6	6.9	9.2	11.5	13.8	17.3	20.6	27.7		
70°	2.8	5.6	8.4	11.2	14.0	16.8	21.0	25.2	33.6		
80°	3.4	6.7	10.1	13.4	16.8	20.2	25.2	30.3	40.3		
90°	4.0	8.0	12.0	16.0	20.0	24.0	30.0	36.0	48.0		
100°	4.8	9.5	14.3	19.1	23.8	28.6	35.8	43.0			
110°	5.7	11.4	17.1	22.8	28.5	34.3	42.8	51.4			
120°	6.9	13.9	20.8	27.7	34.6	41.6	52.0	62.4			
130°	8.6	17.2	25.7	34.3	42.9	51.5	64.4				
140°	10.9	21.9	32.9	43.8	54.8	65.7					
150°	14.9	29.8	44.7	59.6	74.5						
170°	45.8	91.6									

**NOTE:** Data shown is theoretical and does not take into consideration the effects of gravity, gas flow, or high pressure operation.

## EXAMPLES:

**Problem:** To achieve a 10" diameter spray coverage from a nozzle mounted 15" from the target, what spray angle would be required?

**Solution:** 40° Spray Angle

**Problem:** How far from the target should a nozzle with a 110° spray angle be mounted in order to achieve a 36" diameter spray?

**Solution:** Approximately 15".

(Actual coverage will be less than theoretical coverage listed in the table.)

**NOTE:** For applications where coverage is critical, contact BETE Applications Engineering using the Application Intake Form on page 109.

# Research & Development

## RESEARCH & DEVELOPMENT

BETE's state-of-the-art **Spray Laboratory** plays a key role in supporting both product R&D and our customer service network.

Equipped with sophisticated video-image processing and digital analysis technology, the Spray Lab makes possible rapid nozzle development and evaluation.

The Spray Lab is also available on a contract basis to provide confidential, quantitative evaluation of nozzle performance. Industrial applications for contract testing range from comparative nozzle performance testing to development of proprietary designs. These capabilities allow our customers to optimize process performance while minimizing capital and operating costs—a winning combination in today's competitive global marketplace.

### Spray Laboratory Capabilities

- Flow rate (water) measurements from 0.01 to 2000 gpm
- Flow rate (air) measurements to 3000 scfm
- Pressure measurements to 10,000 psi
- Automated drop size distribution measurement from less than 2 to greater than 15,000 microns
- Computerized spray distribution analysis
- Two-fluid capabilities up to 3000 scfm air / 2000 gpm water
- 30' x 50' x 22' high test area

### DROPLET ANALYSIS

Frustrated by the limited capabilities of laser-based instruments, BETE developed the Model 700 Video Particle Analyzer. This flexible system allows BETE to characterize the difficult sprays containing significant numbers of large and non-spherical drops

often encountered in industrial applications. The Model 700 is a video-imaging system combining a CCD video camera, microscope lens, fast strobed xenon light source, and image processing hardware and software running on a host PC-compatible computer.

### PATTERN DISTRIBUTION ANALYSIS

The BETE Patternator is a unique digital video system for accurately analyzing the volumetric distribution of liquid emitted from a nozzle. The system uses a standard tube patternator combined with BETE's custom shape recognition and timing software. From this digitized information, spray density and effective spray angles are calculated.

Because data collection and analyses are handled by computer, the device is very well-suited for handling the large amount of data required for nozzle development and assessment programs.

Consistently and accurately selecting appropriate sampling positions is extremely important when performing drop size analysis. The challenge lies in sampling the spray in such a way that the number and locations of the individual tests chosen present a reasonable representation of the entire spray. Recognizing this, BETE has integrated the patternator with the Model 700 analyzer on a calibrated X-Y-Z positioner and developed a number of sampling protocols for droplet size analysis. These protocols ensure that the reported drop size distributions most accurately reflect the overall spray performance, thus allowing a high degree of repeatability and confidence.

### COMPUTER MODELING AND SIMULATION

There are instances when duplicating the operating environment in the spray lab is impossible. When the nozzle is to be used in a high-temperature or pressure environment or sprayed in a high velocity gas stream, BETE Applications Engineers use computer modeling and simulation software developed in-house to assist in specifying the proper nozzle.

Spray-modeling has also been used to predict spray behavior in HF mitigation systems and to specify nozzles and layouts on offshore drilling platforms. Other applications include predicting spray drift from cooling ponds and dust suppression systems and estimating evaporation rates from disposal ponds.

Working with engineering companies and consulting groups, BETE Engineering tap this modeling and simulation technology to offer customized spray nozzle solutions to some of the most vexing problems facing industry today.

### INDUSTRY COOPERATIVE DEVELOPMENT PROGRAMS

BETE has worked closely with major industries in research and development programs addressing personnel safety and environmental protection issues.

BETE has provided technical expertise, computer simulation, testing, and nozzle prototypes in a variety of projects, including:

- fire control aboard offshore drilling platforms
- toxic gas control
- oil spill cleanup
- reducing CFC use in the semiconductor industry





# Conversions & Equations

## Flow rate

$$Q = K (PSI)^x$$

$$\left(\frac{Q_2}{Q_1}\right) = \sqrt{\frac{SG_1}{SG_2}}$$

$$PSI = \left(\frac{Q}{K}\right)^{1/x}$$

Vessel with internal pressure:

$$\left(\frac{Q_2}{Q_1}\right) = \left(\frac{PSI_2}{PSI_1}\right)^x$$

$$GPM = K (PSI_{inlet} - PSIVessel)^x$$

Nozzle Series	Exponent x	Nozzle Series	Exponent x
BJ	0.50	PJ	0.50
CW	0.47	PSR	0.50
FF	0.50	SC	0.47
IS	0.50	SPN	0.50
L	0.50	ST	0.50
LEM	0.50	STXP	0.50
LP	0.50	TC	0.46
MaxiPass	0.47	TD/TDL	0.50
MicroWhirl	0.50	TF	0.50
N	0.50	TFXP	0.50
NC	0.47	TH, THW	0.50
NCJ	0.47	TW	0.50
NCK	0.47	WL	0.47
NCS	0.47	WT	0.50
NF	0.50	WTX	0.50
P	0.50	WTZ	0.50

## Dropsizes

## System Design

$$\left(\frac{D_2}{D_1}\right) = \left(\frac{P_2}{P_1}\right)^{0.3}$$

$$PSI_{Pump} = PSI_{Nozzle} + PSI_{Pipe Losses} + \frac{\rho h}{144}$$

Conversion Data		
MULTIPLY	BY	TO OBTAIN
atmospheres	1.013	bar
atmospheres	33.931	feet of water
atmospheres	1.0332	kg/cm <sup>2</sup>
atmospheres	101.3	kiloPascals (kPa)
atmospheres	14.696	psi
bar	100	kPa
bar	14.5	psi
barrels (oil)	42	gallons
centimeters	0.3937	inches
centiStokes	Sp. gravity	centiPoise
cm <sup>3</sup>	0.061	in <sup>3</sup>
cm <sup>3</sup>	0.000264	gallons
cm <sup>3</sup>	0.001	liters
ft <sup>3</sup>	1728	inches
ft <sup>3</sup>	0.02832	m <sup>3</sup>
ft <sup>3</sup>	7.48	gallons
ft <sup>3</sup>	28.32	liters
ft <sup>3</sup> (water)	62.43	pounds (water)
in <sup>3</sup>	16.39	cm <sup>3</sup>
in <sup>3</sup>	0.00433	gallons
in <sup>3</sup>	0.164	liters
m <sup>3</sup>	35.31	ft <sup>3</sup>
m <sup>3</sup>	61.024	in <sup>3</sup>
m <sup>3</sup>	264.2	gallons
m <sup>3</sup>	1000	liters
degree (angle)	60	minutes
degree (Celsius)	(°C x 1.8) +32	degree (Fahrenheit)
degree (Fahrenheit)	(°F-32) x 0.56	degree (Celsius)
feet	0.3048	meters
feet/sec	30.48	centimeters/sec

Conversion Data		
MULTIPLY	BY	TO OBTAIN
feet/sec	18.29	meters/min
feet of water	0.0295	atmospheres
feet of water	0.884	inches of mercury
feet of water	0.433	psi
gallons	3785	cm <sup>3</sup>
gallons	0.1337	ft <sup>3</sup>
gallons	0.83267	imperial gallons
gallons	3.785	liters
gallons/min	0.06309	liters/sec
imperial gallons	1.2	gallons
horsepower	1.014	horsepower (metric)
horsepower	33.000	foot pounds/min
horsepower	746	Watts
inches	2.54	centimeters
kg/cm <sup>2</sup>	14.22	psi
kiloWatts	1.340	horsepower
liters	1000	cm <sup>3</sup>
liters	0.264	gallons
liters	0.22	imperial gallons
liters	33.8	ounces (fluid)
meters	3.281	feet
microns (µm)	0.0394	thousandth of an inch
miles/hr	44.7	centimeters/sec
miles/hr	1.467	feet/sec
millimeters	0.0394	inches
psi	0.068	atmospheres
psi	0.06895	bar
psi	2.307	feet of water
psi	0.0703	kg/cm <sup>2</sup>
psi	6.895	kPa

## Terms and Conditions.

Prices quoted are FOB, Greenfield, MA. Terms are 1%/10 net 30 days for approved ac-accounts. Minimum order is \$50.00 net. A restocking charge of 15% will apply for standard product accepted for return up to one year from the date of purchase. BETE FOG NOZZLE reserves the right to charge interest on past-due accounts. No goods may be returned without prior authorization. Non-Standard items are not subject to return.

BETE FOG NOZZLE reserves the right to make changes in specifications or design at any time without notice. Illustrations shown in this catalog are for information only.

**Warranty**—all goods are warranted for good workmanship in accordance with industry standard and will perform in accordance with the products' specification.

**Limitation of Liability**—BETE's liability shall be limited to the value of the product billed arising from a purchase order.