



# TF

## Wide Range of Flows and Angles

### DESIGN FEATURES

- The original spiral nozzle invented by BETE and continuously improved!
- High energy efficiency
- One-piece/no internal parts
- Clog-resistant performance
- High discharge velocity
- Male connection standard; female connection available by special order

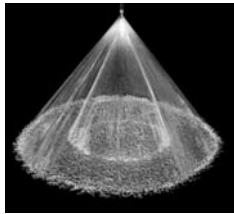
### SPRAY CHARACTERISTICS

- Wide range of flow rates and spray angles
  - Fine atomization
- Spray patterns:** Full Cone.  
 For Hollow Cone, see page 45  
**Spray angles:** 50° to 180°  
**Flow rates:** 2.26 to 10700 l/min  
 (Higher flow rates available)

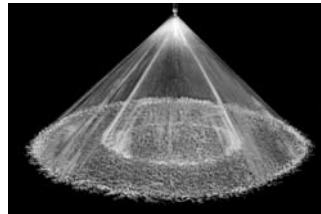


60°, 90°, 120° Metal

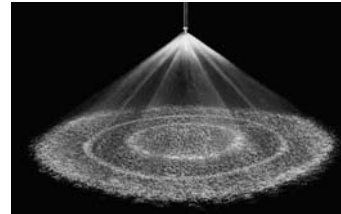
Available with FM approval: N series (page 106), 1/4" TF8 NN, FCN in brass, 1/2" TF24-150 in multiple materials



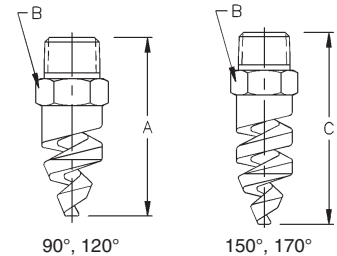
Full Cone 60° (NN)



Full Cone 90° (FCN)



Full Cone 150°/170°



Dimensions are approximate. Check with BETE for critical dimension applications

### TF Full Cone Flow Rates and Dimensions

Full Cone, 60° (NN), 90° (FCN or FFCN), 120° (FC or FFC), 150° and 170° Spray Angles, 1/8" to 4" Pipe Sizes, BSP or NPT

Male Pipe Size	Nozzle Number	Available Spray Angles 60° 90° 120° 150° 170°	K Factor	LITERS PER MINUTE @ BAR							PTFE not recommended above red line			Metal Only above green line			Approx. (mm)		Dim. (mm) for Metal Only*			Wt. (g)	
				0.5 bar	0.7 bar	1 bar	2 bar	3 bar	5 bar	10 bar	20 bar	Orif. Dia.	Free Pass Dia.	Orif. Dia.	Free Pass Dia.	A	B	C	60°	90°	120°		
1/8	TF6	60° 90° 120° 150° 170°	3.19	2.26	2.67	3.19	4.5	5.5	7.1	10.1	14.3	2.38	2.38	42.9	14.3	42.9	28	6					
	TF8	60° 90° 120° 150° 170°	5.93	4.19	4.96	5.93	8.4	10.3	13.2	18.7	26.5	3.18	3.18	42.9	14.3	55.6							
1/4	TF6	60° 90° 120° 150° 170°	3.19	2.26	2.67	3.19	4.5	5.5	7.1	10.1	14.3	2.38	2.38	47.6	14.3	47.6	35	6					
	TF8	60° 90° 120° 150° 170°	5.93	4.19	4.96	5.93	8.4	10.3	13.2	18.7	26.5	3.18	3.18	47.6	14.3	60.3							
	TF10	60° 90° 120° 150° 170°	9.12	6.45	7.63	9.12	12.9	15.8	20.4	28.8	40.8	3.97	3.18	47.6	14.3	60.3							
3/8	TF6	60° 90° 120°	3.19	2.26	2.67	3.19	4.5	5.5	7.1	10.1	14.3	2.38	2.38	47.6	17.5	60.5	46	7					
	TF8	60° 90° 120°	5.93	4.19	4.96	5.93	8.4	10.3	13.2	18.7	26.5	3.18	3.18										
	TF10	60° 90° 120°	9.12	6.45	7.63	9.12	12.9	15.8	20.4	28.8	40.8	3.97	3.18										
	TF12	60° 90° 120° 150° 170°	13.7	9.67	11.4	13.7	19.3	23.7	30.6	43.2	61.1	4.76	3.18										
	TF14	60° 90° 120° 150° 170°	18.5	13.1	15.4	18.5	26.1	32.0	41.3	58.4	82.6	5.56	3.18										
	TF16	60° 90° 120° 150° 170°	24.2	17.1	20.2	24.2	34.2	41.8	54.0	76.4	108	6.35	3.18										
1/2	TF20	60° 90° 120° 150° 170°	37.6	26.6	31.5	37.6	53.2	65.1	84.1	119	168	7.94	3.18				85	14					
	TF24	60° 90° 120° 150° 170°	54.9	38.8	46.0	54.9	77.7	95.1	123	174	246	9.53	4.76	63.5	22.2	77.7							
3/4	TF28	60° 90° 120° 150° 170°	75.2	53.2	62.9	75.2	106	130	168	238	336	11.1	4.76				156	25					
	TF32	60° 90° 120° 150° 170°	95.7	67.7	80.1	95.7	135	166	214	303	428	12.7	4.76	69.9	28.6	88.9							
1	TF40	60° 90° 120° 150° 170°	153	108	128	153	216	264	341	483	683	15.9	6.35	92.1	34.9	111	241	71					
	TF48	60° 90° 120° 150° 170°	217	153	181	216	306	375	484	685	968	19.1	6.35										
1 1/2	TF56	60° 90° 120° 150° 170°	294	208	246	294	416	509	657	930	1320	22.2	7.94	111	50.8	137	624	120					
	TF64	60° 90° 120° 150° 170°	385	272	322	385	545	667	861	1220	1720	25.4	7.94	111	50.8	137							
	TF72	60° 90° 120° 150° 170°	438	309	366	438	619	758	978	1380	1960	28.6	7.94	111	50.8	143							
2	TF88	60° 90° 120° 150° 170°	638	451	534	638	902	1110	1430	2020	2850	34.9	11.1	143	63.5	175	1300	227					
	TF96 <sup>1</sup>	60° 90° 120° 150° 170°	806	570	674	806	1140	1400	1800	2550	3600	38.1	11.1	176	63.5	178	1530	255					
3	TF112 <sup>1</sup>	60° 90° 120° 150° 170°	1170	825	976	1170	1650	2020	2610	3690	5220	44.5	14.3	219	88.9	235	3230	567					
	TF128 <sup>1</sup>	60° 90° 120° 150° 170°	1550	1090	1290	1550	2190	2680	3460	4891	6920	50.8	14.3										
4	TF160 <sup>1</sup>	60° 90° 120°	2390	1690	2000	2390	3380	4140	5350	7570	10700	63.5	15.9	257	114		4790	765					

Flow Rate (l/min) = K √ bar \*Dimensions are for bar stock, cast sizes may vary. \*\*60° nozzles slightly longer; call BETE for details <sup>1</sup>Three turn nozzles

Standard Materials: Brass, 316 Stainless Steel, PVC, Polypropylene, and PTFE (Poly. not available for TF6 thru TF10).

Spray angle performance varies with pressure. Contact BETE for specific data on critical applications.

TO ORDER: specify pipe size, connection type, nozzle number, spray angle, and material.

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## Wide Range of Flows and Angles

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- High energy efficiency
- One-piece/no internal parts
- Clog-resistant performance
- High discharge velocity
- Male connection standard; female connection available by special order

### SPRAY CHARACTERISTICS

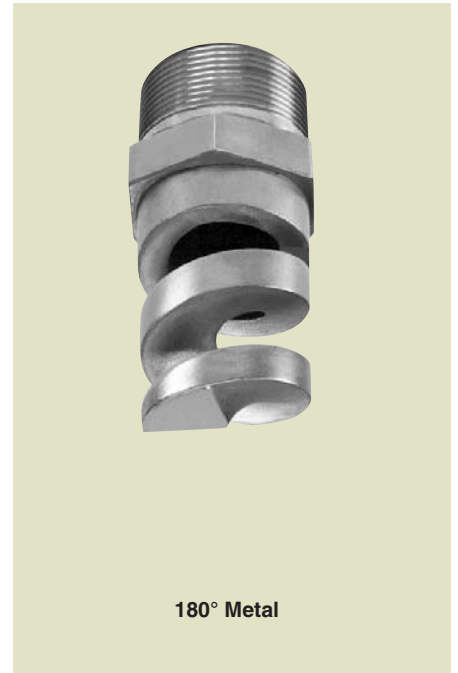
- Wide range of flow rates and spray angles
- Fine atomization

**Spray patterns:** Hollow Cone

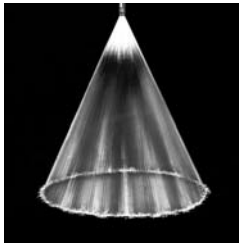
For Full Cone, see page 20

**Spray angles:** 50° to 180°

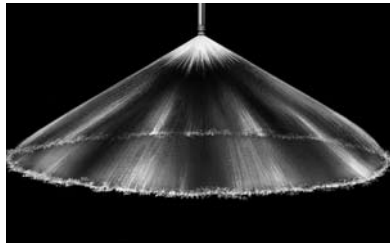
**Flow rates:** 2.26 to 10700 l/min  
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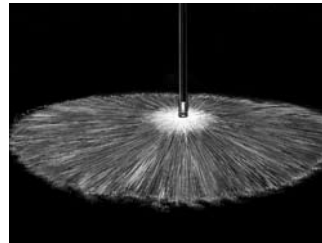
HOLLOW CONE



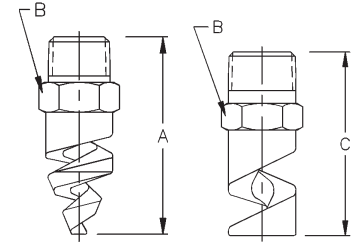
Hollow Cone 50° (N)



Hollow Cone 120° (W)



Hollow Cone 180° (XW)



50°, 60°, 90°, 120°

180°

Dimensions are approximate. Check with BETE for critical dimension applications

### TF Hollow Cone Flow Rates and Dimensions

Hollow Cone, 50° (N), 60° (V), 90° (M), 120° (W), and 180° (XW) Spray Angles, 1/4" to 4" Pipe Sizes, BSP or NPT

Male Pipe Size	Nozzle Number	Available Spray Angles				K Factor	LITERS PER MINUTE @ BAR										Approx. (mm)		Dim. (mm) for Metal Only*			Wt. (g)			
		50°	60°	90°	120°		180°	0.5 bar	0.7 bar	1 bar	2 bar	3 bar	5 bar	10 bar	20 bar	Orif. Dia.	Free Pass. Dia.	A	B	C	180° Metal	180° Plas.			
1/4	TF6	50°	60°	90°	120°	180°	3.19	2.26	2.67	3.19	4.5	5.5	7.1	10.1	14.3	2.38	2.38	42.9	14.3						
	TF8	50°	60°	90°	120°	180°	5.93	4.19	4.96	5.93	8.4	10.3	13.2	18.7	26.5	3.18	3.18	47.6	14.3	47.6	35	21			
	TF10	50°	60°	90°	120°	180°	9.12	6.45	7.63	9.12	12.9	15.8	20.4	28.8	40.8	3.97	3.18	47.6	14.3	47.6					
3/8	TF12	50°	60°	90°	120°	180°	13.7	9.7	11.4	13.7	19.3	23.7	30.6	43.2	61.1	4.76	3.18								
	TF14	50°	60°	90°	120°	180°	18.5	13.1	15.4	18.5	26.1	32.0	41.3	58.4	82.6	5.56	3.18	47.6	17.5 <sup>1</sup>	47.6	50	21			
	TF16	50°	60°	90°	120°	180°	24.2	17.1	20.2	24.2	34.2	41.8	54.0	76.4	108	6.35	3.18								
1/2	TF20	50°	60°	90°	120°	180°	37.6	26.6	31.5	37.6	53.2	65.1	84.1	119	168	7.94	3.18								
	TF24	50°	60°	90°	120°	180°	54.9	38.8	46.0	54.9	77.7	95.1	123	174	246	9.53	4.76	63.5	22.2	60.5	85	25			
3/4	TF28	50°	60°	90°	120°	180°	75.2	53.2	62.9	75.2	106	130	168	238	336	11.1	4.76								
	TF32	50°	60°	90°	120°	180°	95.7	67.7	80.1	95.7	135	166	214	303	428	12.7	4.76	69.9	28.6	76.2	85	28			
1	TF40	60°	90°	120°	180°		153	108	128	153	216	264	341	483	683	15.9	6.35	92.1	34.9	92.2	425	85			
	TF48	60°	90°	120°	180°		217	153	181	216	306	375	484	685	968	19.1	6.35								
1 1/2	TF56	60°	90°	120°	180°		294	208	246	294	416	509	657	930	1320	22.2	7.94								
	TF64	60°	90°	120°	180°		385	272	322	385	545	667	861	1220	1720	25.4	7.94	111	50.8	111	851	170			
	TF72	60°	90°	120°	180°		438	309	366	438	619	758	978	1380	1960	28.6	7.94								
2	TF88	60°	90°	120°	180°		638	451	534	638	902	1110	1430	2020	2850	34.9	11.1	143	63.5	127	1300	227			
	TF96	60°	90°	120°	180°		806	570	674	806	1140	1400	1800	2550	3600	38.1	11.1	176	63.5	127	1530	255			
3	TF112	60°	90°	120°			1170	825	976	1170	1650	2020	2610	3690	5220	44.5	14.3	219	88.9						
	TF128	60°	90°	120°			1550	1090	1290	1550	2190	2680	3460	4891	6920	50.8	14.3								
4	TF160	60°	90°	120°			2390	1690	2000	2390	3380	4140	5350	7570	10700	63.5	15.9	257	114						

Flow Rate (l/min) = K √bar \*Dimensions are for bar stock, cast sizes may vary. <sup>1</sup> 25.4 mm for 180° Large plastic Spirals (above 2") should not be operated above 1 bar

Standard Materials: Brass, 316 Stainless Steel, PVC, Polypropylene, and PTFE (Poly. not available for TF6 - TF10)

TF8 and TF 24 150° are Factory Mutual approved. Contact BETE for more information.

Spray angle performance varies with pressure. Contact BETE for specific data on critical applications.