

# Twist & Dry®

## Twist & Dry Component System

The Twist & Dry® series of nozzles was designed and developed for the spray drying industry, with the dryer operator specifically in mind. The patented locking system locks the swirl and orifice components into place prior to installation on the spray lance, eliminating many of the hassles associated with replacing wear parts and allowing for easier installs. Through continuous development and innovation, BETE offers solutions for high pressure, high temperature, and abrasive media applications.

### DESIGN FEATURES

- Product consistency
- Premium tungsten carbide disc available for extended wear life
- Hand tighten - no special tools required for assembly
- Easy to maintain
- Clog-resistant design
- 218SS body for anti-galling

### SPRAY SET-UPS

The spray angle and flow rate of a Twist and Dry assembly is determined by the swirl and orifice combination. The Twist & Dry series has almost 1,000 different combinations of swirl and orifice discs to provide flow rates and spray angles that fit your needs. To locate the right swirl and orifice combination, refer to the following TD/TD-K and TDL pages.



TD swirl disc



TD orifice disc

### TD Series

The original TD series features BETE's innovative and patented locking lug feature, single piece thick swirl component, clog-resistant design, and multiple carrier options to provide ease of installation, operation, and maintenance.

- BETE's patented lug design
- Clog-resistant design

### TDL Series

The TDL series offers a compact nozzle design that is ideal for small-scale applications and pilot testing.

- BETE's patented lug design
- Small-scale applications
- Pilot testing

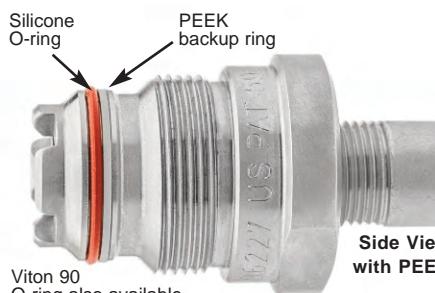


TDL Assembly

### TD-K High Pressure Design

The TD-K series incorporates a PEEK back-up ring and optional Duplex carrier to allow for operation in high-pressure applications. Higher operating pressures can help increase yield, saving time and money. The TD series includes:

- TD-7K: rated for 7,000 psi
- TD-10K: rated for 10,000 psi



Viton 90 O-ring also available

### High Temperature (HT) Design

The HT set-up utilizes a special body design and carrier #7 to replace the traditional O-ring seals with metal gaskets, allowing for operation at high temperatures.

- HT rated for 7,000 psi at 800 °F
- No O-rings



HT Assembly

### TD/TD-K Drip Pro Check Valve

The TD Drip Pro check valve's patented design offers a high-flow solution to reduce drips which can lead to scorched particles and ruined product.

- Fits standard BETE carriers
- Replaces standard TD/TD-K bodies (except HT set-up)
- Drip-free operation
- Easy to assemble



Drip Pro Check Valve

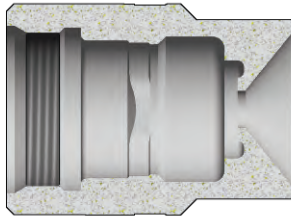
### Tungsten Carbide Options

Pro Grade	Suitable for most general spray drying applications
Premium Grade	Superior wear resistance for extremely abrasive spray media

Same day shipping for wear parts!

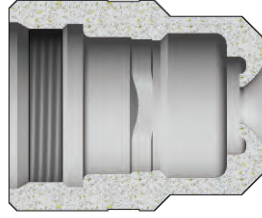
# Twist & Dry® Components & Options

Talk to one of our engineers; we're here to help you find the right solution for your application.  
**413-772-0846**



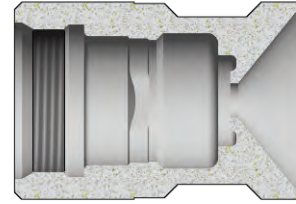
**Durable Beard-Deterring**

Carrier 1 (C11) (shown)  
 Carrier 11 (C111) - without lug



**Standard Carrier**

Carrier 2 (C12) (shown)  
 Carrier 5 (C15) - without lug



**Knife Edge Anti-Bearding**

Carrier 10 (C110) (shown)  
 Carrier 12 (C112) - without lug

## To Order: Spray Set-up Number

**1/4 TD 2 - 025 - C11 - 7K - 45 - CVB - B**

**pipe size**  
add **xx-BW** if Butt Weld  
(include pipe schedule where xx)

**series**

**swirl number**

**orifice**

**carrier style**  
omit for standard carrier (model #2)  
or if using HT set-up (HT body and carrier #7)

**pressure**  
omit for TD/TDL or if using HT set-up (HT body and carrier #7)

**7K** see Material Selection Guide  
includes PEEK backup ring

**10K** see Material Selection Guide  
includes PEEK backup ring and Duplex 2205 carrier material

**connection type**  
omit if NPT or Butt Weld  
**B** if BSP

**check valve**  
omit if no check valve is needed  
or using HT body  
**CVB** for 30 psi (2 bar) cracking pressure  
**CVC** for 75 psi (5 bar) cracking pressure

**temperature**  
omit if temperature is less than or equal to 400 °F (204 °C)  
**45** if temperature is greater than 400 °F (204 °C)  
and less than or equal to 450 °F (232 °C);  
includes Silicone O-ring and PTFE CV seal if applicable  
**HT** if temperature is greater than 450 °F (232 °C)  
and less than or equal to 800 °F (427 °C);  
max pressure 7000 psi (485 bar)

## Twist & Dry Material Selection Guide

Pressure		Temperature			
psi	bar	up to 302 °F (150 °C)	up to 400 °F (204 °C)	up to 450 °F (232 °C)	up to 800 °F (427 °C)
10,000	690	<b>10K Set-up</b> Viton O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	<b>10K Set-up</b> Viton O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	<b>10K Set-up</b> Silicone O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	<b>HT Set-up</b> Metal Gaskets High Temperature Body Carrier #7
		<b>7K Set-up</b> Viton O-ring w/ PEEK Backup Ring	<b>7K Set-up</b> Viton O-ring w/ PEEK Backup Ring	<b>7K Set-up</b> Silicone O-ring w/ PEEK Backup Ring	
5,000	345	<b>TD/TDL Set-up</b> Viton O-ring	<b>TD/TDL Set-up</b> Viton O-ring	<b>TD/TDL Set-up</b> Silicone O-ring	
3,500	240				
800	55				

**SPECIAL PURPOSE**

Call for the name of your nearest BETE representative.  
**CALL 413-772-0846**

# TD/TD-K

## Twist & Dry® Hollow Cone

### DESIGN FEATURES

- Patented locking mechanism for quick and easy change-out and maintenance

### High pressure applications:

- TD-K with PEEK backup ring
- HT body with Carrier #7

### High temperature applications:

- TD/TD-K bodies with silicone O-ring
- HT body with Carrier #7
- Female pipe thread or butt-weld connections
- Hand tighten, no special tools required
- Orifice size: 0.034" through 0.157"
- Interchangeable swirl and orifice discs for variable patterns and flow rates

- Drip Pro check valve available upon request
- **Multiple grades of tungsten carbide to suit application needs**
- Same day shipping of wear parts
- Clog-resistant design
- Easy to maintain

### SPRAY CHARACTERISTICS

- Spray pattern:** Hollow Cone
- Flow rates:** 8.94 to 2,210 gph
- Spray angle:** 50° through 85°, as listed



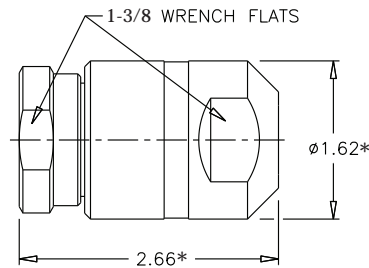
TD Assembly



70° Hollow Cone



Cutaway view of carrier showing BETE's unique locking lug feature



Pipe Size	Weight* (oz.)
1/4"	19
3/8"	18.5
1/2"	18
3/4"	17

Dimensions are approximate. Check with BETE for critical dimension applications.

### Twist & Dry/TD-K Flow Rates

Hollow Cone; 50° - 85° Spray Angles; 1/4", 3/8", 1/2", and 3/4" Pipe Sizes; NPT, BSP, or Weld Prep

Female Pipe Size	Nozzle Number	Spray Angle	Orifice Swirl Dia. (in.)	K Factor	GALLONS PER HOUR @ PSI											Use TD-K for operation over 3,500 psi		
					200 PSI	500 PSI	750 PSI	1000 PSI	1250 PSI	1500 PSI	1750 PSI	2000 PSI	2500 PSI	3000 PSI	4000 PSI	7000 PSI	10,000 PSI	
1/4"	TD2-34	70°	SW2 0.034	0.632	8.94	14.1	17.3	20.0	22.4	24.5	26.5	28.3	31.6	34.6	40.0	52.9	63.2	
	TD1-37	80°	SW1 0.037															
1/4"	TD2-40	75°	SW2 0.040	0.791	11.2	17.7	21.7	25.0	28.0	30.6	33.1	35.4	39.5	43.3	50.0	66.2	79.1	
	TD1-49	85°	SW1 0.049															
1/4"	TD4-34	60°	SW4 0.034	0.949	13.4	21.2	26.0	30.0	33.5	36.7	39.7	42.4	47.4	52.0	60.0	79.4	94.9	
	TD3-40	70°	SW3 0.040															
OR 3/8"	TD5-34	50°	SW5 0.034	1.11	15.7	24.7	30.3	35.0	39.1	42.9	46.3	49.5	55.3	60.6	70.0	92.9	111	
	TD4-40	65°	SW4 0.040															
OR 3/8"	TD4-43	65°	SW4 0.043	1.26	17.9	28.3	34.6	40.0	44.7	49.0	52.9	56.6	63.2	69.3	80.0	105	126	
	TD3-49	75°	SW3 0.049															
OR 1/2"	TD6-37	50°	SW6 0.037	1.42	20.1	31.8	39.0	45.0	50.3	55.1	59.5	63.6	71.2	77.9	90.0	119	142	
	TD5-40	60°	SW5 0.040															
	TD4-46	70°	SW4 0.046															
	TD3-55	75°	SW3 0.055															
OR 3/4"	TD6-40	50°	SW6 0.040	1.58	22.4	35.4	43.3	50.0	55.9	61.2	66.1	70.7	79.1	86.6	100	132	158	
	TD5-43	60°	SW5 0.043															
	TD4-52	70°	SW4 0.052															
	TD5-49	60°	SW5 0.049															
OR 3/4"	TD4-58	70°	SW4 0.058	1.74	24.6	38.9	47.6	55.0	61.5	67.4	72.8	77.8	87.0	95.3	110	146	174	
	TD3-67	80°	SW3 0.067															

$$\text{Flow Rate (GPH)} = K \sqrt{\text{PSI}}$$

Standard Materials: Carrier: Stainless Steel, Duplex; Body: Stainless Steel; Swirl/Orifice: Tungsten Carbide

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

SPECIAL PURPOSE

TO ORDER: specify pipe size, connection type, nozzle number, and material. 413-772-0846

### Twist & Dry/TD-K Flow Rates

Hollow Cone; 50° - 85° Spray Angles; 1/4", 3/8", 1/2", and 3/4" Pipe Sizes; NPT, BSP, or Weld Prep

Female Pipe Size	Nozzle Number	Spray Angle	Swirl	Orifice Dia. (in.)	K Factor	GALLONS PER HOUR @ PSI										Use TD-K for operation over 3,500 psi		
						200 PSI	500 PSI	750 PSI	1000 PSI	1250 PSI	1500 PSI	1750 PSI	2000 PSI	2500 PSI	3000 PSI	4000 PSI	7000 PSI	10,000 PSI
1/4"	TD6-46	55°	SW6	0.046	1.90	26.8	42.4	52.0	60.0	67.1	73.5	79.4	84.9	94.9	104	120	159	190
	TD5-52	65°	SW5	0.052														
	TD4-61	75°	SW4	0.061														
	TD3-70	80°	SW3	0.070														
	TD6-52	55°	SW6	0.052	2.21	31.3	49.5	60.6	70.0	78.3	85.7	92.6	99.0	111	121	140	185	221
	TD5-58	65°	SW5	0.058														
	TD4-70	75°	SW4	0.070														
	TD7-49	50°	SW7	0.049	2.53	35.8	56.6	69.3	80.0	89.4	98.0	106	113	126	139	160	212	253
	TD6-55	60°	SW6	0.055														
	TD5-64	70°	SW5	0.064														
	TD4-76	80°	SW4	0.076														
	TD7-52	50°	SW7	0.052	2.85	40.2	63.6	77.9	90.0	101	110	119	127	142	156	180	238	285
TD6-61	60°	SW6	0.061															
TD5-70	70°	SW5	0.070															
TD7-58	55°	SW7	0.058	3.16	44.7	70.7	86.6	100	112	122	132	141	158	173	200	264	316	
TD6-64	65°	SW6	0.064															
TD5-76	75°	SW5	0.076															
TD4-91	80°	SW4	0.091															
OR	TD7-61	55°	SW7	0.061	3.48	49.2	77.8	95.3	110	123	135	146	156	174	191	220	291	348
	TD6-70	65°	SW6	0.070														
	TD5-82	75°	SW5	0.082														
3/8"	TD7-64	55°	SW7	0.064	3.79	53.7	84.9	104	120	134	147	159	170	190	208	240	317	379
	TD6-76	65°	SW6	0.076														
	TD5-88	75°	SW5	0.088														
OR	TD8-67	50°	SW8	0.067	4.74	67.1	106	130	150	168	184	198	212	237	260	300	397	474
	TD7-76	60°	SW7	0.076														
	TD6-88	70°	SW6	0.088														
	TD5-109	80°	SW5	0.109														
1/2"	TD8-76	50°	SW8	0.076	5.69	80.5	127	156	180	201	221	238	255	285	312	360	476	569
	TD7-85	65°	SW7	0.085														
	TD6-103	75°	SW6	0.103														
OR	TD8-82	55°	SW8	0.082	6.64	93.9	148	182	210	235	257	278	297	332	364	420	556	664
	TD7-97	65°	SW7	0.097														
	TD6-115	75°	SW6	0.115														
3/4"	TD9-82	50°	SW9	0.082	7.59	107	170	208	240	268	294	317	339	379	416	480	635	759
	TD8-91	60°	SW8	0.091														
	TD7-106	70°	SW7	0.106														
	TD6-127	80°	SW6	0.127														
	TD9-88	50°	SW9	0.088	8.54	121	191	234	270	302	331	357	382	427	468	540	715	854
	TD8-100	60°	SW8	0.100														
	TD7-118	70°	SW7	0.118														
	TD6-142	80°	SW6	0.142														
	TD9-94	55°	SW9	0.094	9.49	134	212	260	300	335	367	397	424	474	520	600	794	949
	TD8-106	65°	SW8	0.106														
	TD7-127	75°	SW7	0.127														
	TD9-106	55°	SW9	0.106	11.1	157	247	303	350	391	429	463	495	553	606	700	929	1110
	TD8-121	65°	SW8	0.121														
	TD7-145	75°	SW7	0.145														
	TD10-103	50°	SW10**	0.103	12.7	179	283	346	400	447	490	529	566	632	693	800	1063	1270
	TD9-115	60°	SW9	0.115														
	TD8-133	70°	SW8	0.133														
	TD10-118	55°	SW10**	0.118	14.2	201	318	390	450	503	551	595	636	712	779	900	1188	1420
	TD9-127	60°	SW9	0.127														
	TD8-145	70°	SW8	0.145														
	TD9-136	65°	SW9	0.136	15.8	224	354	433	500	559	612	661	707	791	866	1000	1322	1580
	TD8-157	75°	SW8	0.157														
	TD9-148	65°	SW9	0.148	17.4	246	389	476	550	615	674	728	778	870	953	1100	1456	1740
	TD10-136	60°	SW10**	0.136	19.0	268	424	520	600	671	735	794	849	949	1040	1200	1590	1900
	TD9-154	70°	SW9	0.154														
	TD10-151	60°	SW10**	0.151	20.6	291	460	563	650	727	796	860	919	1030	1130	1300	1724	2060
	TD10-157	65°	SW10**	0.157	22.1	313	495	606	700	783	857	926	990	1110	1210	1400	1849	2210

Flow Rate (GPH) = K√PSI

Standard Materials: Carrier: Stainless Steel, Duplex; Body: Stainless Steel; Swirl/Orifice: Tungsten Carbide

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

\*\*SW10 only available in Pro Grade Tungsten Carbide

# TDL

## Twist & Dry® Low Flow Hollow Cone

### DESIGN FEATURES

- Patented locking mechanism for quick and easy change-out and maintenance
- Lower flow rates than Twist & Dry series
- Female-threaded or butt weld pipe connections
- Orifice size: 0.018" through 0.058"
- Interchangeable swirl and orifice discs for variable patterns and flow rates

### SPRAY CHARACTERISTICS

- Hollow Cone
- Flow rates:** 2.86 to 123 gph
- Spray angle:** 70° - 75°

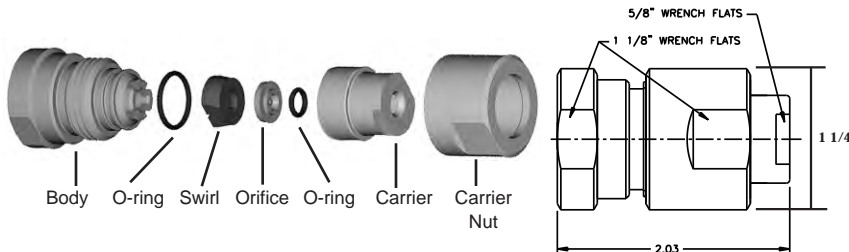
Ideal for small-scale applications and pilot tests



TDL Assembly



70° Hollow Cone



Pipe Size	Weight (oz)
1/4"	4.2
3/8"	3.8

Dimensions are approximate. Check with BETE for critical dimension applications.

### TDL Flow Rates

Hollow Cone, 70° - 75° Spray Angles, 1/4" and 3/8" Pipe Sizes, NPT or BSP

Female Pipe Size	Nozzle Number	Orifice Dia. (in.)	K Factor	GALLONS PER HOUR @ PSI											
				200 PSI	500 PSI	750 PSI	1000 PSI	1250 PSI	1500 PSI	1750 PSI	2000 PSI	2500 PSI	3000 PSI	4000 PSI	5000 PSI
1/4"	TDL4-18	SWL4 0.018	0.202	2.86	4.53	5.54	6.40	7.16	7.84	8.47	9.1	10.1	11.1	12.8	14.3
	TDL4-20	SWL4 0.020	0.215	3.04	4.81	5.89	6.80	7.60	8.33	9.00	9.62	10.8	11.8	13.6	15.2
	TDL4-22	SWL4 0.022	0.237	3.35	5.30	6.50	7.50	8.39	9.19	9.92	10.6	11.9	13.0	15.0	16.8
	TDL4-24	SWL4 0.024	0.272	3.85	6.08	7.45	8.60	9.62	10.5	11.4	12.2	13.6	14.9	17.2	19.2
	TDL4-27	SWL4 0.027	0.316	4.47	7.07	8.66	10.0	11.2	12.2	13.2	14.1	15.8	17.3	20.0	22.4
	TDL1-22	SWL1 0.022	0.348	4.92	7.78	9.53	11.0	12.3	13.5	14.6	15.6	17.4	19.1	22.0	24.6
OR	TDL1-24	SWL1 0.024	0.395	5.59	8.84	10.8	12.5	14.0	15.3	16.5	17.7	19.8	21.7	25.0	28.0
	TDL1-27	SWL1 0.027	0.459	6.48	10.3	12.6	14.5	16.2	17.8	19.2	20.5	22.9	25.1	29.0	32.4
	TDL1-30	SWL1 0.030	0.522	7.38	11.7	14.3	16.5	18.4	20.2	21.8	23.3	26.1	28.6	33.0	36.9
	TDL2-30	SWL2 0.030	0.632	8.94	14.1	17.3	20.0	22.4	24.5	26.5	28.3	31.6	34.6	40.0	44.7
	TDL2-33	SWL2 0.033	0.712	10.1	15.9	19.5	22.5	25.2	27.6	29.8	31.8	35.6	39.0	45.0	50.3
	TDL2-36	SWL2 0.036	0.791	11.2	17.7	21.7	25.0	28.0	30.6	33.1	35.4	39.5	43.3	50.0	55.9
3/8"	TDL2-38	SWL2 0.038	0.838	11.9	18.7	22.9	26.5	29.6	32.5	35.1	37.5	41.9	45.9	53.0	59.3
	TDL2-40	SWL2 0.040	0.917	13.0	20.5	25.1	29.0	32.4	35.5	38.4	41.0	45.9	50.2	58.0	64.8
	TDL2-42	SWL2 0.042	0.949	13.4	21.2	26.0	30.0	33.5	36.7	39.7	42.4	47.4	52.0	60.0	67.1
	TDL2-44	SWL2 0.044	0.980	13.9	21.9	26.8	31.0	34.7	38.0	41.0	43.8	49.0	53.7	62.0	69.3
	TDL2-46	SWL2 0.046	1.03	14.5	23.0	28.1	32.5	36.3	39.8	43.0	46.0	51.4	56.3	65.0	72.7
	TDL2-48	SWL2 0.048	1.11	15.7	24.7	30.3	35.0	39.1	42.9	46.3	49.5	55.3	60.6	70.0	78.3
	TDL2-50	SWL2 0.050	1.15	16.3	25.8	31.6	36.5	40.8	44.7	48.3	51.6	57.7	63.2	73.0	81.6
	TDL2-52	SWL2 0.052	1.25	17.7	27.9	34.2	39.5	44.2	48.4	52.3	55.9	62.5	68.4	79.0	88.3
	TDL2-54	SWL2 0.054	1.30	18.3	29.0	35.5	41.0	45.8	50.2	54.2	58.0	64.8	71.0	82.0	91.7
	TDL2-56	SWL2 0.056	1.33	18.8	29.7	36.4	42.0	47.0	51.4	55.6	59.4	66.4	72.7	84.0	93.9
3/8"	TDL3-50	SWL3 0.050	1.42	20.0	31.7	38.8	44.8	50.1	54.9	59.3	63.4	70.8	77.6	89.6	100
	TDL3-52	SWL3 0.052	1.51	21.4	33.8	41.4	47.8	53.4	58.5	63.2	67.6	75.6	82.8	95.6	107
	TDL3-54	SWL3 0.054	1.60	22.6	35.7	43.7	50.5	56.5	61.8	66.8	71.4	79.8	87.5	101	113
	TDL3-56	SWL3 0.056	1.69	23.9	37.8	46.3	53.5	59.8	65.5	70.8	75.7	84.6	92.7	107	120
TDL3-58	SWL3 0.058	1.74	24.6	38.9	47.6	55.0	61.5	67.4	72.8	77.8	87.0	95.3	110	123	

$$\text{Flow Rate (GPH)} = K\sqrt{\text{PSI}}$$

Standard Materials: Carrier: Stainless Steel; Body: Stainless Steel; Swirl/Orifice: Tungsten Carbide

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

SPECIAL PURPOSE

TO ORDER: specify pipe size, connection type, nozzle number, and material. 413-772-0846