

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

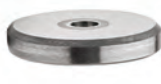
- Product consistency
- Premium tungsten carbide disc available for extended wear life
- Hand tighten - no special tools required for assembly
- Easy to maintain
- Clog-resistant design
- 218SS body for anti-galling

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 best to 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

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 485 bar at 427 °C
- No O-rings

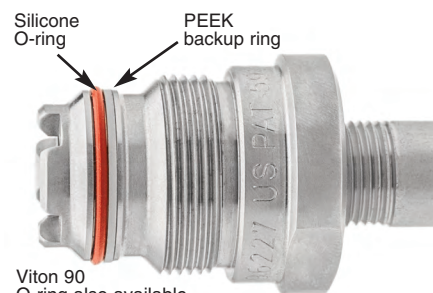


HT Assembly

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 485 bar
- TD-10K: rated for 690 bar



Side View: TD-K body with PEEK backup ring

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!

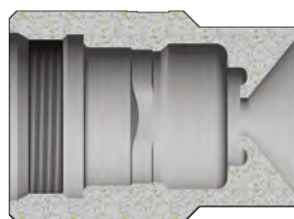
www.BETE.com

SPECIAL PURPOSE

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

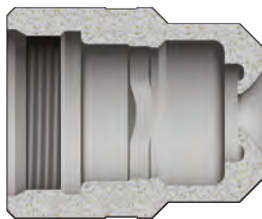
Twist & Dry® Components & Options

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



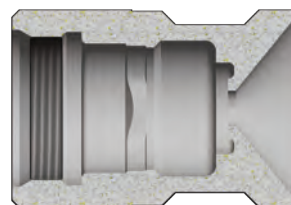
Durable Beard-Deterring

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	10K Set-up Viton O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	10K Set-up Viton O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	10K Set-up Silicone O-ring w/ PEEK Backup Ring Carrier in Duplex 2205	HT Set-up Metal Gaskets High Temperature Body Carrier #7
7,000	485	7K Set-up Viton O-ring w/ PEEK Backup Ring	7K Set-up Viton O-ring w/ PEEK Backup Ring	7K Set-up Silicone O-ring w/ PEEK Backup Ring	
5,000	345	TD/TDL Set-up Viton O-ring	TD/TDL Set-up Viton O-ring	TD/TDL Set-up Silicone O-ring	
3,500	240				
800	55				

SPECIAL PURPOSE

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

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-threaded or butt weld connections
- Hand tighten, no special tools required
- Orifice size: 0.864mm through 3.99mm
- 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: 35.3 to 8,379 L/h

Spray angle: 50° through 85°, as listed



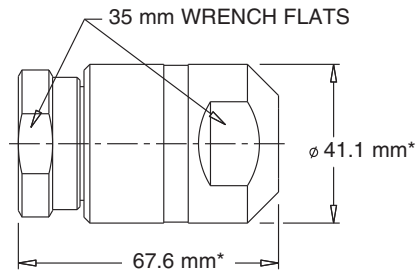
TD Assembly



70° Hollow Cone



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



Pipe Size	Weight* (g)
1/4"	539
3/8"	524
1/2"	510
3/4"	482

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

Twist & Dry/TD-K Flow Rates

Hollow Cone; 50° to 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 (mm)	K Factor	LITERS PER HOUR @ BAR										Use TD-K for operation over 240 bar		
						15 bar	35 bar	50 bar	70 bar	90 bar	100 bar	120 bar	150 bar	175 bar	200 bar	300 bar	500 bar	690 bar
1/4"	TD2-34	70°	SW2	0.864	9.12	35.3	53.9	64.5	76.3	86.5	91.2	99.9	112	121	129	158	204	240
	TD1-37	80°	SW1	0.94														
	TD2-40	75°	SW2	1.02	11.4	44.1	67.4	80.6	95.3	108	114	125	140	151	161	197	255	299
	TD1-49	85°	SW1	1.24														
OR	TD4-34	60°	SW4	0.864	13.7	53.0	80.9	96.7	114	130	137	150	167	181	193	237	306	360
	TD3-40	70°	SW3	1.02														
3/8"	TD5-34	50°	SW5	0.864	16.0	61.8	94.4	113	133	151	160	175	195	211	226	277	358	420
	TD4-40	65°	SW4	1.02														
	TD4-43	65°	SW4	1.09														
OR	TD3-49	75°	SW3	1.24	18.2	70.6	108	129	153	173	182	200	223	241	258	315	407	478
	TD6-37	50°	SW6	0.94														
1/2"	TD5-40	60°	SW5	1.02	20.5	79.4	121	145	172	195	205	225	251	271	290	355	458	538
	TD4-46	70°	SW4	1.17														
	TD3-55	75°	SW3	1.40														
OR	TD6-40	50°	SW6	1.02	22.8	88.3	135	161	191	216	228	250	279	301	322	395	510	599
	TD5-43	60°	SW5	1.09														
3/4"	TD4-52	70°	SW4	1.32	25.1	97.1	148	177	210	238	251	275	307	332	355	435	561	659
	TD5-49	60°	SW5	1.24														
	TD4-58	70°	SW4	1.47														
	TD3-67	80°	SW3	1.70														

Flow Rate (L/h) = K √ bar

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° to 80° 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 (mm)	K Factor	LITERS PER HOUR @ BAR										Use TD-K for operation over 240 bar			
						15 bar	35 bar	50 bar	70 bar	90 bar	100 bar	120 bar	150 bar	175 bar	200 bar	300 bar	500 bar	690 bar	
1/4"	TD6-46	55°	SW6	1.17	27.4	106	162	193	229	259	273	300	335	362	387	475	613	720	
	TD5-52	65°	SW5	1.32															
	TD4-61	75°	SW4	1.55															
	TD3-70	80°	SW3	1.78															
	TD6-52	55°	SW6	1.32	31.9	124	189	226	267	303	319	349	391	422	451	553	713	838	
	TD5-58	65°	SW5	1.47															
	TD4-70	75°	SW4	1.78															
	TD7-49	50°	SW7	1.24	36.5	141	216	258	305	346	365	399	447	482	516	632	816	959	
	TD6-55	60°	SW6	1.4															
	TD5-64	70°	SW5	1.63															
	TD4-76	80°	SW4	1.93															
	TD7-52	50°	SW7	1.32	41.0	159	243	290	343	389	410	449	502	543	580	710	917	1077	
TD6-61	60°	SW6	1.55																
TD5-70	70°	SW5	1.78																
OR	TD7-58	55°	SW7	1.47	45.6	177	270	322	381	432	456	499	558	603	645	790	1020	1198	
	TD6-64	65°	SW6	1.63															
	TD5-76	75°	SW5	1.93															
	TD4-91	80°	SW4	2.31															
OR	TD7-61	55°	SW7	1.55	50.1	194	297	355	419	476	501	549	614	663	709	868	1120	1316	
	TD6-70	65°	SW6	1.78															
	TD5-82	75°	SW5	2.08															
3/8"	TD7-64	55°	SW7	1.63	54.7	212	324	387	458	519	547	599	670	724	773	947	1223	1437	
	TD6-76	65°	SW6	1.93															
	TD5-88	75°	SW5	2.24															
OR	TD8-67	50°	SW8	1.7	68.4	265	404	483	572	649	684	749	837	904	967	1185	1529	1797	
	TD7-76	60°	SW7	1.93															
	TD6-88	70°	SW6	2.24															
OR	TD5-109	80°	SW5	2.77	82.0	318	485	580	686	778	820	899	1010	1090	1160	1420	1834	2154	
	TD8-76	50°	SW8	1.93															
	TD7-85	65°	SW7	2.16															
OR	TD6-103	75°	SW6	2.62	95.7	371	566	677	801	908	957	1050	1170	1270	1350	1658	2140	2514	
	TD8-82	55°	SW8	2.08															
	TD7-97	65°	SW7	2.46															
1/2"	TD6-115	75°	SW6	2.92	109	424	647	773	915	1040	1090	1200	1340	1450	1550	1888	2437	2863	
	TD9-82	50°	SW9	2.08															
	TD8-91	60°	SW8	2.31															
	TD7-106	70°	SW7	2.69															
OR	TD6-127	80°	SW6	3.23	123	477	728	870	1030	1170	1230	1350	1510	1630	1740	2130	2750	3231	
	TD9-88	50°	SW9	2.24															
	TD8-100	60°	SW8	2.54															
	TD7-118	70°	SW7	3.00															
OR	TD6-142	80°	SW6	3.61	137	530	809	967	1140	1300	1370	1500	1680	1810	1930	2373	3063	3599	
	TD9-94	55°	SW9	2.39															
	TD8-106	65°	SW8	2.69															
3/4"	TD7-127	75°	SW7	3.23	160	618	944	1130	1340	1510	1600	1750	1950	2110	2260	2771	3578	4203	
	TD9-106	55°	SW9	2.69															
	TD8-121	65°	SW8	3.07															
	OR	TD7-145	75°	SW7	3.68	182	706	1080	1290	1530	1730	1820	2000	2230	2410	2580	3152	4070	4781
		TD10-103	50°	SW10**	2.62														
		TD9-115	60°	SW9	2.92														
	OR	TD8-133	70°	SW8	3.38	205	794	1210	1450	1720	1950	2050	2250	2510	2710	2900	3551	4584	5385
		TD10-118	55°	SW10**	3.00														
		TD9-127	60°	SW9	3.23														
	OR	TD8-145	70°	SW8	3.68	228	883	1350	1610	1910	2160	2280	2500	2790	3020	3220	3949	5098	5989
		TD9-136	65°	SW9	3.45														
		TD8-157	75°	SW8	3.99														
OR	TD9-148	65°	SW9	3.76	251	971	1480	1770	2100	2380	2510	2750	3070	3320	3550	4347	5613	6593	
	TD10-136	60°	SW10**	3.45															
	TD9-154	70°	SW9	3.91															
OR	TD10-151	60°	SW10**	3.84	296	1150	1750	2100	2480	2810	2960	3250	3630	3920	4190	5127	6619	7775	
	TD10-157	65°	SW10**	3.99															
					319	1240	1890	2260	2670	3030	3190	3500	3910	4220	4510	5525	7133	8379	

Flow Rate (L/h) = K √ bar

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 the Twist & Dry series
- Female-threaded or butt weld pipe connections
- Orifice size: 0.457mm through 1.47mm
- Interchangeable swirl and orifice discs for variable patterns and flow rates

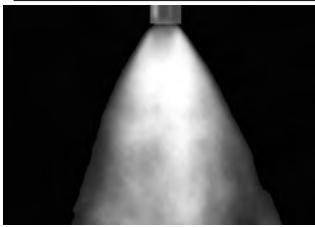
SPRAY CHARACTERISTICS

- Hollow Cone
- Flow rates:** 11.3 to 416 L/h
- Spray angle:** 70° - 75°

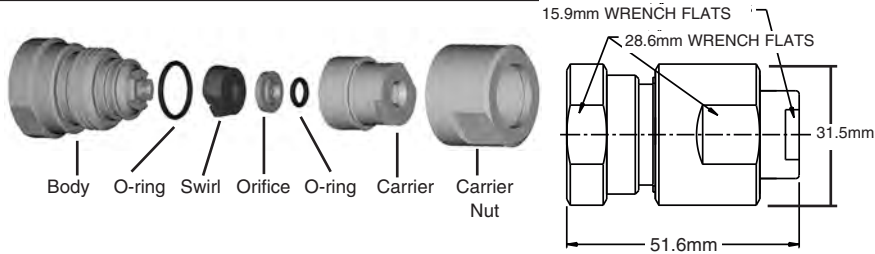
Ideal for small-scale applications and pilot tests



Female



70° Hollow Cone



Pipe Size	Weight (g)
1/4"	119
3/8"	107

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	Swirl	Orifice Dia. (mm)	K Factor	LITERS PER HOUR @ BAR										
					15 bar	35 bar	50 bar	70 bar	90 bar	100 bar	120 bar	150 bar	175 bar	200 bar	275 bar
1/4"	TDL4-18	SWL4	0.457	2.92	11.3	17.3	20.6	24.4	27.7	29.2	32.0	35.7	36.6	41.3	48.4
	TDL4-20	SWL4	0.508	3.10	12.0	18.3	21.9	25.9	29.4	31.0	34.0	38.0	41.0	43.8	51.4
	TDL4-22	SWL4	0.559	3.42	13.2	20.2	24.2	28.6	32.4	34.2	37.4	41.9	45.2	48.3	56.7
	TDL4-24	SWL4	0.610	3.92	15.2	23.2	27.7	32.8	37.2	39.2	42.9	48.0	51.9	55.4	65.0
	TDL4-27	SWL4	0.686	4.56	17.7	27.0	32.2	38.1	43.2	45.6	49.9	55.8	60.3	64.5	75.6
	TDL1-22	SWL1	0.559	5.01	19.4	29.7	35.5	41.9	47.6	50.1	54.9	61.4	66.3	70.9	83.1
	TDL1-24	SWL1	0.610	5.70	22.1	33.7	40.3	47.7	54.0	57.0	62.4	69.8	75.4	80.6	94.5
	TDL1-27	SWL1	0.686	6.61	25.6	39.1	46.7	55.3	62.7	66.1	72.4	80.9	87.4	93.5	110
	TDL1-30	SWL1	0.762	7.52	29.1	44.5	53.2	62.9	71.3	75.2	82.4	92.1	99.5	106	125
	TDL2-30	SWL2	0.762	9.12	35.3	53.9	64.5	76.3	86.5	91.2	100	112	121	129	151
OR	TDL2-33	SWL2	0.838	10.3	39.7	60.7	72.5	85.5	97.3	103	112	126	136	145	170
	TDL2-36	SWL2	0.914	11.4	44.1	67.4	80.6	95.3	108	114	125	140	151	161	189
	TDL2-38	SWL2	0.965	12.1	46.8	71.5	85.4	101	115	121	132	148	160	171	200
	TDL2-40	SWL2	1.02	13.2	51.2	78.2	93.5	111	125	132	145	162	175	187	219
	TDL2-42	SWL2	1.07	13.7	53.0	80.9	96.7	114	130	137	150	167	181	193	227
	TDL2-44	SWL2	1.12	14.1	54.7	83.6	100	118	134	141	155	173	187	200	234
	TDL2-46	SWL2	1.17	14.8	57.4	87.6	105	124	141	148	162	181	196	209	246
	TDL2-48	SWL2	1.22	16.0	61.8	94.4	113	133	151	160	175	195	211	226	265
	TDL2-50	SWL2	1.27	16.6	64.4	98.4	118	139	158	166	182	204	220	235	276
	TDL2-52	SWL2	1.32	18.0	69.7	107	127	151	171	180	197	220	238	255	298
3/8"	TDL2-54	SWL2	1.37	18.7	72.4	111	132	156	177	187	205	229	247	264	310
	TDL2-56	SWL2	1.42	19.1	74.1	113	135	160	182	191	210	234	253	271	317
	TDL3-50	SWL3	1.27	20.4	79.1	121	144	171	194	204	224	250	270	289	339
	TDL3-52	SWL3	1.32	21.8	84.4	129	154	182	207	218	239	267	288	308	361
	TDL3-54	SWL3	1.37	23.0	89.1	136	163	193	218	230	252	282	304	326	382
	TDL3-56	SWL3	1.42	24.4	94.4	144	172	204	231	244	267	299	323	345	404
	TDL3-58	SWL3	1.47	25.1	97.1	148	177	210	238	251	275	307	332	355	416

$$\text{Flow Rate (L/h)} = K \sqrt{\text{bar}}$$

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.

www.BETE.com

SPECIAL PURPOSE

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