

Twist & Dry®

Twist & Dry® Component System

The Twist & Dry component system was developed for the spray dryer industry. The TD-K was next developed as an innovative solution to expand spray dryer capacity up to 689 bar. The patented locking system locks components into place prior to installation. There are many interchangeable swirls and orifice disks available for varying the flow rates of the nozzles. Many materials are also available to allow for high temperature usage without leakage.

SPRAY SET-UPS

Twist & Dry nozzles have almost 1,000 different combinations of swirl and orifice discs to provide exactly the right flow rate and angle for your needs. The spray angle and flow rate are determined by the "swirl/orifice set-up"—a specific combination of one swirl disc and one orifice. To locate the right swirl and orifice combination refer to the following TD-K, Twist & Dry, and TDL pages.

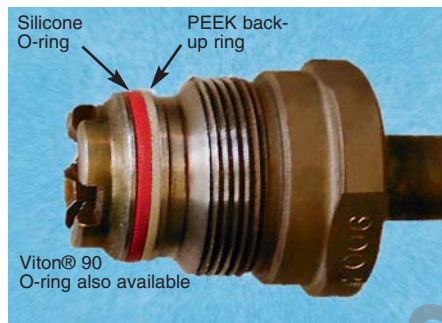
Spray angle is determined by the orifice geometry. Carriers and bodies differ in both material and design to accommodate both high temperature and pressure. The robust design allows for many material choices and combinations.



TDL Low Flow Twist & Dry® Assembly

TD-K High Pressure Series

The TD-K is a high pressure nozzle in the Twist & Dry series. The series includes models TD-7K rated up to 483 bar and the TD-10K rated up to 689 bar.



Side View: TD-K body with PEEK backup ring

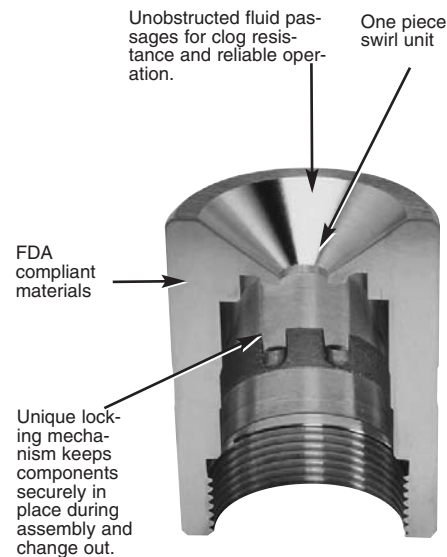
Often higher pressures can increase yield and save money. Please visit www.bete.com/td-k.html.

Twist & Dry Series

The Twist & Dry is a BETE original design that answers the needs of the spray drying industry. The BETE design offers superior performance as well as an innovative patented locking mechanism. Replace the wear parts of your spray dry nozzles without turning the lances upside down.

The BETE Twist & Dry is designed with the operator in mind. If you operate and maintain a spray dryer, you know just how difficult it can be to replace the nozzle wear parts.

These unique features of the Twist & Dry design makes this chore much easier: fewer parts; rugged design—one piece swirl unit \ greatly reduces breakage of tungsten carbide pieces; easy assembly—the BETE Twist & Dry locking system keeps the swirl chamber and orifice "locked" into position during assembly; Materials—corrosion-resistant 303 Stainless Steel carrier, Tungsten Carbide swirl unit and orifice disk, Viton® O-rings, other materials are available. BETE provides software support, also: users of the Twist & Dry receive free-of-charge computer software that greatly simplifies selecting the correct swirl unit and orifice disk.



Cutaway view of the Twist & Dry carrier



TD swirl disc



TD orifice disc



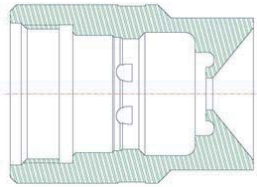
BETE Twister tool is specially designed for the Twist & Dry nozzle series.

SPECIAL PURPOSE

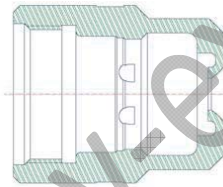
TO ORDER: specify pipe size, connection type, nozzle number, and material.

Twist & Dry® Components & Options

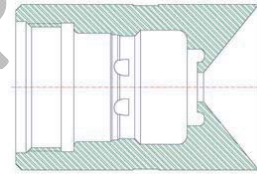
Pressure		Temperature		
bar	psi	up to 250°F (121°C)	up to 400°F (204°C)	up to 450°F (232°C)
689	10,000	TD 10K Viton 90 O-ring w/ PEEK Backup Ring Carrier in Duplex 2205 TD 10K only available in Carriers 5 and 11	TD 10K Viton 90 O-ring w/ PEEK Backup Ring Carrier in Duplex 2205 TD 10K only available in Carriers 5 and 11	TD 10K Silicone O-ring w/ PEEK Backup Ring Carrier in Duplex 2205 TD 10K only available in Carriers 5 and 11
483	7,000	TD 7K Viton 90 O-ring w/ PEEK Backup Ring	TD 7K Viton 90 O-ring w/ PEEK Backup Ring	TD 7K Silicone O-ring w/ PEEK Backup Ring
345	5,000	TD Viton 90 O-ring	TD Viton 90 O-ring	TD Silicone O-ring
241	3,500			
55	800			



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



Standard TD Carrier
Carrier 2 (C112) (shown)
Carrier 5 (C115) - without lugs



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

To Order: Spray Set-up Number

1/4 TD 2 - 034 - C11 - 7K - 45 - B @ 7N

pipe size	series	swirl number	orifice	carrier style <small>omit for standard carrier, model #2</small>	thread <small>omit if NPT</small>	material
<p style="text-align: center;">pressure</p> <p><small>omit if pressure is less than or equal to 3,500 psi (241 bar)</small></p> <p>7K if pressure is greater than 3,500 psi and less than or equal to 7,000 psi; needs PEEK backup ring</p> <p>10K if pressure is greater than 7,000 psi and less than or equal to 10,000 psi; needs PEEK backup ring + Duplex 2205 carrier material</p>					<p style="text-align: center;">temperature</p> <p><small>omit if temperature is less than or equal to 400°F (204°C)</small></p> <p>45 if temperature is greater than 400°F and less than or equal to 450°F (232°C); needs Silicone O-ring</p>	

PEEK™ is a registered trademark of Victrex.

SPECIAL PURPOSE

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

TD/TD-K

Twist & Dry® Hollow Cone

DESIGN FEATURES

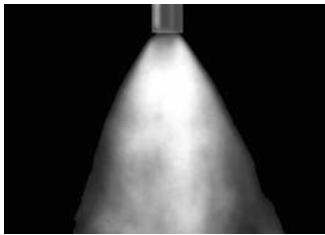
- Patented locking mechanism for quick and easy change-out and maintenance
- Choose TD-K to operate at high pressures for greater yield capacity
- PEEK backup ring with Viton® 90 O-rings or Silicone for higher temperatures)
- Female-threaded or butt weld pipe connections
- Easy assembly, no special tools required
- Orifice size: 0.864mm through 3.99mm

- Interchangeable swirl and orifice discs for variable patterns and flow rates
- Please visit www.bete.com/td-k.html for more information on the TD-K nozzle

SPRAY CHARACTERISTICS

- Hollow Cone
- Flow rates:** 35.3 to 5,970 l/hr
- Spray angle:** 50°, 55°, 60°, 65°, 70°, 75°, 80°

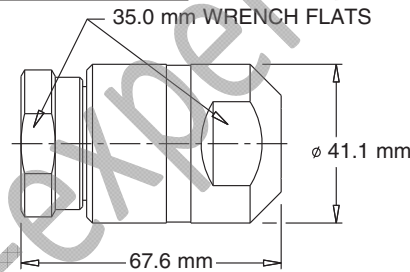
Check valve available upon request



70° Hollow Cone



Cutaway view of carrier showing lugs and BETE's unique locking design



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 and Dimensions

Hollow Cone, 50° to 80° Spray Angles, 1/4", 3/8", 1/2" and 3/4" Pipe Size NPT, BSP or Welded

Female Pipe Size	Nozzle Number	Spray Angle	Swirl	Orifice (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	350 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	151	171
	TD1-37	80°	SW1	0.940													
OR	TD2-40	75°	SW2	1.02	11.4	44.1	67.4	80.6	95.3	108	114	125	140	151	161	189	213
	TD1-49	85°	SW1	1.24													
3/8"	TD4-34	60°	SW4	0.864	13.7	53.0	80.9	96.7	114	130	137	150	167	181	193	227	256
	TD3-40	70°	SW3	1.02													
OR	TD5-34	50°	SW5	0.864	16.0	61.8	94.4	113	133	151	160	175	195	211	226	265	298
	TD4-40	65°	SW4	1.02													
OR	TD4-43	65°	SW4	1.09	18.2	70.6	108	129	153	173	182	200	223	241	258	302	341
	TD3-49	75°	SW3	1.24													
1/2"	TD6-37	50°	SW6	0.940	20.5	79.4	121	145	172	195	205	225	251	271	290	340	384
	TD5-40	60°	SW5	1.02													
	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	378	426
	TD5-43	60°	SW5	1.09													
	TD4-52	70°	SW4	1.32													
3/4"	TD5-49	60°	SW5	1.24	25.1	97.1	148	177	210	238	251	275	307	332	355	416	469
	TD4-58	70°	SW4	1.47													
	TD3-67	80°	SW3	1.70													

$$\text{Flow Rate (l/hr)} = K \sqrt{\text{bar}}$$

Standard Materials: 316 Stainless Steel, Tungsten Carbide. Other materials available.

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.

Twist & Dry Flow Rates and Dimensions

Hollow Cone, 50° to 80° Spray Angles, 1/4", 3/8", 1/2" and 3/4" Pipe Size NPT, BSP or Welded

Female Pipe Size	Nozzle Number	Spray Angle	Dia Swirl (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	350 bar
	TD6-46	55°	SW6 1.17	27.4	106	162	193	229	259	273	300	335	362	387	453	512
	TD5-52	65°	SW5 1.32													
	TD4-61	75°	SW4 1.55													
	TD3-70	80°	SW3 1.78													
1/4"	TD6-52	55°	SW6 1.32	31.9	124	189	226	267	303	319	349	391	422	451	529	597
	TD5-58	65°	SW5 1.47													
	TD4-70	75°	SW4 1.78													
	TD7-49	50°	SW7 1.24													
OR	TD6-55	60°	SW6 1.40	36.5	141	216	258	305	346	365	399	447	482	516	605	682
	TD5-64	70°	SW5 1.63													
	TD4-76	80°	SW4 1.93													
	TD7-52	50°	SW7 1.32													
OR	TD6-61	60°	SW6 1.55	41.0	159	243	290	343	389	410	449	502	543	580	680	767
	TD5-70	70°	SW5 1.78													
	TD7-58	55°	SW7 1.47													
	TD6-64	65°	SW6 1.63													
OR	TD5-76	75°	SW5 1.93	45.6	177	270	322	381	432	456	499	558	603	645	756	853
	TD4-91	80°	SW4 2.31													
	TD7-61	55°	SW7 1.55													
	TD6-70	65°	SW6 1.78													
OR	TD5-82	75°	SW5 2.08	50.1	194	297	355	419	476	501	549	614	663	709	831	938
	TD7-64	55°	SW7 1.63													
	TD6-76	65°	SW6 1.93													
	TD5-88	75°	SW5 2.24													
OR	TD8-67	50°	SW8 1.70	68.4	265	404	483	572	649	684	749	837	904	967	1130	1280
	TD7-76	60°	SW7 1.93													
	TD6-88	70°	SW6 2.24													
	TD5-109	80°	SW5 2.77													
OR	TD8-76	50°	SW8 1.93	82.0	318	485	580	686	778	820	899	1010	1090	1160	1360	1540
	TD7-85	65°	SW7 2.16													
	TD6-103	75°	SW6 2.62													
	TD8-82	55°	SW8 2.08													
OR	TD7-97	65°	SW7 2.46	95.7	371	566	677	801	908	957	1050	1170	1270	1350	1590	1790
	TD6-115	75°	SW6 2.92													
	TD9-82	50°	SW9 2.08													
	TD8-91	60°	SW8 2.31													
OR	TD7-106	70°	SW7 2.69	109	424	647	773	915	1040	1090	1200	1340	1450	1550	1810	2050
	TD6-127	80°	SW6 3.23													
	TD9-88	50°	SW9 2.24													
	TD8-100	60°	SW8 2.54													
OR	TD7-118	70°	SW7 3.00	123	477	728	870	1030	1170	1230	1350	1510	1630	1740	2040	2300
	TD6-142	80°	SW6 3.61													
	TD9-94	55°	SW9 2.39													
	TD8-106	65°	SW8 2.69													
OR	TD7-127	75°	SW7 3.23	137	530	809	967	1140	1300	1370	1500	1680	1810	1930	2270	2560
	TD9-106	55°	SW9 2.69													
	TD8-121	65°	SW8 3.07													
	TD7-145	75°	SW7 3.68													
OR	TD10-103	50°	SW10 2.62	182	706	1080	1290	1530	1730	1820	2000	2230	2410	2580	3020	3410
	TD9-115	60°	SW9 2.92													
	TD8-133	70°	SW8 3.38													
	TD10-118	55°	SW10 3.00													
OR	TD9-127	60°	SW9 3.23	205	794	1210	1450	1720	1950	2050	2250	2510	2710	2900	3400	3840
	TD8-145	70°	SW8 3.68													
	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	4160	4690
	TD10-136	60°	SW10 3.45													
	TD9-154	70°	SW9 3.91													
	TD10-151	60°	SW10 3.84													
OR	TD10-157	65°	SW10 3.99	296	1150	1750	2100	2480	2810	2960	3250	3630	3920	4190	4910	5540
	TD10-157	65°	SW10 3.99													

Flow Rate (l/hr) = K √ bar

Standard Materials: 316 Stainless Steel, Tungsten Carbide. Other materials available.

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