

# 20K NOZZLES

**20K TLX Nozzles** The APS stainless steel TLX Nozzles come in pressure ratings to match your flex or rigid lances. The 20K-TLX have Autoclave-type MP threads. All have wrench flats for easy installation on the lance. All offer many options for 3 or 4 rows of precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-TLX MP	Dimensions
16-004-001	16-004-101	1/4" MP	.375" OD x 1.375" L
16-005-001	16-005-101	3/8" MP	.468" OD x 1.650" L
16-006-001	16-006-101	9/16" MP	.687" OD x 2.063" L



**20K MP Male Standard Nozzles** The 20K-MP Male Standard Nozzle is designed to go with flex or rigid lances with either right or left hand Autoclave-type medium pressure threads, a special seating design with wrench flats for easy installation, and offer a wide range of options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-MP-M	Dimensions
16-020-004	16-020-001	1/4"-28 MP (M)	.375" OD x 1.250" L
16-020-005	16-020-002	3/8"-24 MP (M)	.500" OD x 1.500" L
16-020-006	16-020-003	9/16"-18 MP (M)	.625" OD x 1.625" L

Part ID	Description	Dimensions
16-020-009	BLANK, BALL TYPE, 13MM TYPE M	(20K MAWP) X 1-1/8" DIA. X 1-3/4" LONG NOZZLE



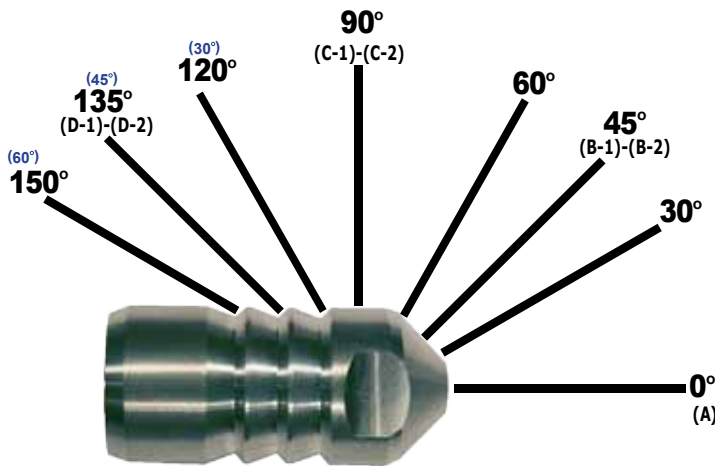
**20K Standard Nozzles with Tungsten Carbide Blade** The APS tungsten carbide tipped tube nozzles are to be used in rotary applications for the removal of hardened plugs in heat exchanger tubes. Please specify drilling pattern, pressure and flow when ordering.



LH Part #	20K-MP-M	Dimensions
16-001-221	1/4" MP RH	.375" OD x 1.225" L
16-002-221	3/8" MP RH	.468" OD x 1.375" L
16-003-221	9/16" MP RH	.687" OD x 1.625" L

## Typical Tube Nozzle Drill Patterns

Please specify drilling pattern, pressure and flow when ordering.



Use this handy reference when designing your customized drilled orifice locations. If you have any questions, call our highly experienced staff.

**20K MP Standard Nozzles** The economical APS stainless steel MP Standard style nozzles come in pressure ratings to match your flex or rigid lances. The 20K-MP Standard Nozzle is designed to go with lances with either right or left hand Autoclave-type medium pressure threads, a special seating design that eliminates the requirement for gland nuts and collars, wrench flats for easy installation, and offer a wide range of options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-MP STD.	Dimensions
16-001-001	16-001-101	1/4" MP	.375" OD x 1.225" L
16-002-001	16-002-101	3/8" MP	.468" OD x 1.375" L
16-003-001	16-003-101	9/16" MP	.687" OD x 1.625" L
16-010-001	16-010-101	3/4" MP	1.00" OD x 1.875" L



**20K Button Tip Nozzles** APS Button-Tip compact stainless steel nozzles are ideal for cleaning small diameter tubes with small radius bends. The 20K-BT have Autoclave-type MP threads, and offer many options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-BT MP	Dimensions
16-007-001	16-007-101	1/4" MP	.375" OD x 0.875" L
16-008-001	16-008-101	3/8" MP	.468" OD x 1.000" L
16-009-001	16-009-101	9/16" MP	.687" OD x 1.125" L
16-021-001	16-021-101	3/4" MP	1.00" OD x 1.375" L



**20K Control Gun Nozzle Holders for Drop-In Nozzles** APS makes its quick-change 9/16" MP (F) Nozzle Holders for control guns to accommodate the TC Drop-In Tips (below) common to shotgun cleaning applications. Simply unscrew the cap and drop in the appropriate nozzle for the job.

Part #	Description
17-025-000	9/16" MP Nozzle Holder Assembly, Complete
17-025-001	Cap, 9/16" MP Nozzle Holder
17-025-002	Body, 9/16" MP Nozzle Holder
30-001-010	O-Ring, 9/16" MP Nozzle Holder, 2-010 Buna-N



**20K Drop-In Tungsten Carbide Fan Tip Nozzles** The APS TC Drop-In Fan-Tip Nozzles are compact inserts made to drop into the typical quick-change nozzle holder body common to shotgun cleaning applications.

Part #	Jet Size	Part #	Jet Size
17-026-021	0.021"	17-026-047	0.047"
17-026-024	0.024"	17-026-051	0.051"
17-026-026	0.026"	17-026-055	0.055"
17-026-028	0.028"	17-026-059	0.059"
17-026-031	0.031"	17-026-062	0.062"
17-026-036	0.036"	17-026-067	0.067"
17-026-041	0.041"	17-026-075	0.075"
17-026-043	0.043"		

Please specify orifice size, pressure and flow when ordering.

**20K Drop-In Tungsten Carbide Hard Hitter Nozzles** The APS TC Drop-In Hard-Hitter Nozzles are compact inserts made to drop into the typical quick-change nozzle holder body common to shotgun cleaning applications.

Part #	Jet Size	Part #	Jet Size
17-025-021	0.021"	17-025-043	0.043"
17-025-024	0.024"	17-025-047	0.047"
17-025-026	0.026"	17-025-051	0.051"
17-025-028	0.028"	17-025-055	0.055"
17-025-031	0.031"	17-025-059	0.059"
17-025-036	0.036"	17-025-062	0.062"
17-025-041	0.041"	17-025-076	0.076"

Please specify orifice size, pressure and flow when ordering.

**20K APLM Pineapple Line Mole Nozzles** The APS APLM pineapple-type line mole nozzles are made from stainless steel with a special copper coating to prevent galling during installation. APLM nozzles have 9/16 and 3/4" NPT inlets with 1/4" or 3/8" NPT (F) ports, and a choice of port locations. These are used with line mole inserts listed on the next page. Wrench flats allow for easy installation.



Part ID	Description	PSI/Bar
16-025-001	NOZZLE, 20K STANDARD PINEAPPLE (3/4" MPF INLET X 1/2"-28 FMS PORTS) 1@A, 3@B(45° FORWARD), 6@C(0° RADIAL), 6@D(45° BACK)	20K/1379
16-025-002	NOZZLE, 20K SPECIAL PINEAPPLE (3/4" MPF INLET X 1/2"-28 FMS PORTS) 3@B(45° FORWARD), 4@C(0° RADIAL), 4@D(45° BACK)	20K/1379
16-025-003	NOZZLE, SP-3/4" MP LH PINEAPPLE (1 @ A, 2-1/4"-28 PORTS @ B @ 60°, 2-1/4"-28 PORTS @ C @ 90°, 2-1/4"-28 PORTS @ D @ 45° (1-5/8" DIA.)	20K/1379
16-025-004	NOZZLE, SP-3/4" MP LH PINEAPPLE (1 @ A, 3-3/8"-24 JEWELLED PORTS @ B @ 45°, 6-3/8"-24 JEWELLED PORTS @ C @ 90° (2-3/4" DIA.)	20K/1379
16-025-005	NOZZLE, SP-3/4" MP LH 20K EA No PINEAPPLE (4-1/4"-28 PORTS @ B @ 60°, 4-1/4"-28 PORTS @ C @ 90°, 4-1/4"-28 PORTS @ D @ 45° (1-5/8" DIA.)	20K/1379
16-025-006	NOZZLE, SP-3/4" MP LH 20K PINEAPPLE (4-3/8"-24 JEWELLED PORTS @ B @ 60°, 4-3/8"-24 JEWELLED PORTS @ C @ 90°, 4-3/8"-24 JEWELLED PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-007	NOZZLE, SP-3/4" MP LH 20K PINEAPPLE (4-3/8"-24 PORTS @ B @ 30°, 4-3/8"-24 PORTS @ C @ 90°, 4-3/8"-24 PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-009	NOZZLE, SP-9/16" MP (13/16"-16 RHF) 20K PINEAPPLE (4-1/16" NPTF PORTS @ C1 @ 15° FWD., 4-1/16" NPTF PORTS @ C2 @ 15° FWD. MIS-ALIGNED, (1-1/4" DIA.)	20K/1379
16-025-010	NOZZLE, SP-9/16" MPF (13/16"-16 RHF) 20K PINEAPPLE (2-1/4" NPTF PORTS @ C @ 90°, 4-1/4" NPTF PORTS @ D @ 45° ALIGNED, (2-1/4" DIA. X 4-1/2" LONG)	20K/1379
16-025-020	NOZZLE, SP-9/16" MP (F) 20K ROUNDED PINEAPPLE (2 PORTS @ C2 @ 20° BACK, 2-1/4" NPT PORTS @ C1 @ 20° BACK) (1-1/2" DIA. X 2.875 LONG)	20K/1379
16-025-107	NOZZLE, SP-9/16" HP LH 20K PINEAPPLE (4-3/8"-24 PORTS @ B @ 30°, 4-3/8"-24 PORTS @ C @ 90°, 4-3/8"-24 PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-112	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-3/8"-24 RH JETS @ A2 @ 75° FWD.), 4-3/8"-24 RH JETS @ B (45° FWD.) (2-3/4" DIA.)	20K/1379
16-025-116	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-1/4"-28 RH JETS @ A2 @ 75° FWD., 4-1/4"-28 RH JETS @ B @ 45° FWD.) (1-9/16" DIA.)	20K/1379
16-025-117	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-3/8"-24 RH JETS @ A2 @ 75° FWD., 4-3/8"-24 RH JETS @ B @ 45° FWD.) (1-15/16" DIA.)	20K/1379
16-025-119	BAR, SP-9/16" HP RH 40K SPRAY (4-1/4"-28 RH JETS @ 30° INC., 2-1/4"-28 RH JETS @ 90°) (6-1/4" DIA.) (TAPPED HOLE FOR HC 090 PULLING RING)	20K/1379

**20K Monroe-Jet Orbital Nozzles** APS proudly offers the Monroe-Jet orbital nozzles in a wide variety of flows and pressure ratings to suit your application. 9/16"-18 RH and M14 x 1.5LH inlet threads are available upon request. Please specify orifice size and flow when ordering.



Part #	Description/Orifice	PSI / Flow
16-201-035	Repair Kit - .035"/0.90 mm	20K @ 4.7 GPM
16-201-043	Repair Kit - .043"/1.10 mm	20K @ 7.0 GPM
16-201-045	Repair Kit - .045"/1.15 mm	20K @ 7.7 GPM
16-201-049	Repair Kit - .049"/1.25 mm	20K @ 9.1 GPM
16-201-051	Repair Kit - .051"/1.30 mm	20K @ 9.8 GPM
16-201-061	Repair Kit - .061"/1.55 mm	20K @ 14.0 GPM
16-201-063	Repair Kit - .063"/1.60 mm	20K @ 14.9 GPM
16-201-075	Repair Kit - .075"/1.90 mm	20K @ 21.0 GPM

Part #	Description / Connection	PSI / Flow	Orifice
16-200-024	Type F1 / 9/16"-18 LH	20K @ 2.0 GPM	.024"/.60 mm
16-200-026	Type F1 / 9/16"-18 LH	20K @ 2.5 GPM	.026"/.65 mm
16-200-028	Type F1 / 9/16"-18 LH	20K @ 2.9 GPM	.028"/.70 mm
16-200-030	Type F1 / 9/16"-18 LH	20K @ 3.3 GPM	.030"/.75 mm
16-200-031	Type F1 / 9/16"-18 LH	20K @ 3.7 GPM	.031"/.80 mm
16-200-033	Type F1 / 9/16"-18 LH	20K @ 4.2 GPM	.033"/.85 mm
16-200-035	Type F1 / 9/16"-18 LH	20K @ 4.7 GPM	.035"/.90 mm
16-200-037	Type F1 / 9/16"-18 LH	20K @ 5.3 GPM	.037"/.95 mm
16-200-039	Type F1 / 9/16"-18 LH	20K @ 5.8 GPM	.039"/1.0 mm
16-200-041	Type F1 / 9/16"-18 LH	20K @ 6.4 GPM	.041"/1.05 mm
16-200-043	Type F1 / 9/16"-18 LH	20K @ 7.0 GPM	.043"/1.10 mm
16-200-045	Type F1 / 9/16"-18 LH	20K @ 7.7 GPM	.045"/1.15 mm
16-200-047	Type F1 / 9/16"-18 LH	20K @ 8.4 GPM	.047"/1.20 mm
16-200-049	Type F1 / 9/16"-18 LH	20K @ 9.1 GPM	.049"/1.25 mm
16-200-051	Type F1 / 9/16"-18 LH	20K @ 9.8 GPM	.051"/1.30 mm
16-200-053	Type F1 / 9/16"-18 LH	20K @ 10.6 GPM	.053"/1.35 mm
16-200-055	Type F1 / 9/16"-18 LH	20K @ 11.4 GPM	.055"/1.40 mm
16-200-057	Type F1 / 9/16"-18 LH	20K @ 12.2 GPM	.057"/1.45 mm
16-200-059	Type F1 / 9/16"-18 LH	20K @ 13.1 GPM	.059"/1.50 mm
16-200-061	Type F1 / 9/16"-18 LH	20K @ 14.0 GPM	.061"/1.55 mm
16-200-063	Type F1 / 9/16"-18 LH	20K @ 14.9 GPM	.063"/1.60 mm
16-200-065	Type F1 / 9/16"-18 LH	20K @ 15.8 GPM	.065"/1.65 mm
16-200-067	Type F1 / 9/16"-18 LH	20K @ 16.8 GPM	.067"/1.70 mm

# 20K NOZZLES

**20K Patented High-Performance Sapphire Orifice Assemblies** The APS High-Performance Sapphire Nozzle Assemblies are compact inserts made to screw into the most typical UHP rotary nozzle holder bodies common to UHP cleaning applications.

All are 3/8"-24 RH. The 17-002 part series is stat-tested.

Please specify orifice size, pressure and flow when ordering.

Part #	Jet Size
17-001-000	PLUG
17-001-007	0.007"
17-001-008	0.008"
17-001-009	0.009"
17-001-010	0.010"
17-001-011	0.011"
17-001-012	0.012"
17-001-013	0.013"
17-001-014	0.014"
17-001-015	0.015"
17-001-016	0.016"
17-001-017	0.017"
17-001-018	0.018"
17-001-019	0.019"
17-001-020	0.020"
17-001-021	0.021"
17-001-022	0.022"
17-001-023	0.023"
17-001-024	0.024"
17-001-025	0.025"
17-001-026	0.026"

Part #	Jet Size
17-001-027	0.027"
17-001-028	0.028"
17-001-029	0.029"
17-001-031	0.031"
17-001-034	0.034"
17-001-035	0.035"
17-001-036	0.036"
17-001-037	0.037"
17-001-038	0.038"
17-001-039	0.039"
17-001-040	0.040"
17-001-043	0.043"
17-001-050	0.050"
17-001-051	0.051"
17-001-052	0.052"
17-001-056	0.056"
17-002-007	0.007"
17-002-008	0.008"
17-002-009	0.009"
17-002-010	0.010"
17-002-011	0.011"

Part #	Jet Size
17-002-012	0.012"
17-002-013	0.013"
17-002-014	0.014"
17-002-015	0.015"
17-002-016	0.016"
17-002-017	0.017"
17-002-018	0.018"
17-002-019	0.019"
17-002-020	0.020"
17-002-021	0.021"
17-002-022	0.022"
17-002-023	0.023"
17-002-025	0.025"
17-002-028	0.028"
17-002-029	0.029"
17-002-031	0.031"
17-002-033	0.033"
17-002-034	0.034"
17-002-035	0.035"
17-002-036	0.036"



**20K High-Performance Sapphire Insert Assemblies** The APS High-Performance Sapphire Nozzle Inserts are compact inserts made to drop into the typical nozzle jewel screw common to UHP jetting applications.

17-006 Series is screw-type and  
17-010 Series is slotted-type.



**17-010  
Slotted-Type  
M4x.5**

Slotted Part #	Jet Size
17-010-100	JEWEL SCREW SLOTTED
17-006-001	SLEEVE
17-010-100	PLUG ASSY SLOTTED
17-010-008	0.008"
17-010-009	0.009"
17-010-010	0.010"
17-101-011	0.011"
17-101-012	0.012"
17-101-013	0.013"
17-101-014	0.014"
17-101-015	0.015"
17-101-016	0.016"
17-101-017	0.017"
17-101-018	0.018"
17-101-019	0.019"
17-101-020	0.020"

Slotted Part #	Jet Size
17-101-021	0.021"
17-101-022	0.022"
17-101-023	0.023"
17-101-024	0.024"
17-101-025	0.025"
17-101-026	0.026"
17-101-027	0.027"
17-101-028	0.028"
17-101-029	0.029"
17-101-030	0.030"
17-101-031	0.031"
17-101-032	0.032"
17-101-033	0.033"
17-101-034	0.034"
17-101-035	0.035"
17-101-036	0.036"

Slotted Part #	Jet Size
17-101-037	0.037"
17-101-038	0.038"
17-101-039	0.039"
17-101-040	0.040"
17-101-041	0.041"
17-101-042	0.042"
17-101-043	0.043"
17-101-044	0.044"
17-101-045	0.045"
17-101-046	0.046"
17-101-047	0.047"
17-101-048	0.048"
17-101-049	0.049"
17-101-050	0.050"
17-101-051	0.051"
17-101-052	0.052"

Screw Part #	Jet Size
17-006-000	JEWEL SCREW HEX
17-006-001	SLEEVE
17-006-112	PLUG ASSY HEX
17-006-008	0.008"
17-006-009	0.009"
17-006-010	0.010"
17-006-011	0.011"
17-006-012	0.012"
17-006-013	0.013"
17-006-014	0.014"
17-006-015	0.015"
17-006-016	0.016"
17-006-017	0.017"
17-006-018	0.018"
17-006-019	0.019"
17-006-020	0.020"

Screw Part #	Jet Size
17-006-021	0.021"
17-006-022	0.022"
17-006-023	0.023"
17-006-024	0.024"
17-006-025	0.025"
17-006-026	0.026"
17-006-027	0.027"
17-006-028	0.028"
17-006-029	0.029"
17-006-030	0.030"
17-006-031	0.031"
17-006-032	0.032"
17-006-033	0.033"
17-006-034	0.034"
17-006-035	0.035"
17-006-036	0.036"

Screw Part #	Jet Size
17-006-037	0.037"
17-006-038	0.038"
17-006-039	0.039"
17-006-040	0.040"
17-006-041	0.041"
17-006-042	0.042"
17-006-043	0.043"
17-006-044	0.044"
17-006-045	0.045"
17-006-046	0.046"
17-006-047	0.047"
17-006-048	0.048"
17-006-049	0.049"
17-006-050	0.050"
17-006-051	0.051"
17-006-052	0.052"

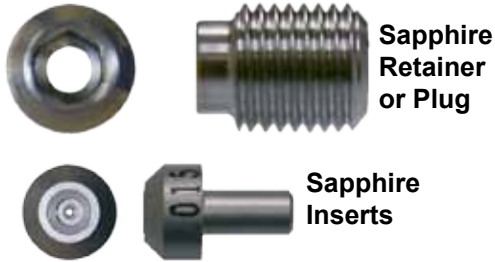


**17-006  
Hex-Type  
M4x.5**

Please specify orifice size, pressure and flow when ordering.

**20K High-Performance Sapphire Orifice Insert** The APS High-Performance Sapphire Orifice Nozzle Inserts are compact inserts made to drop into the typical nozzle jewel screw common to UHP jetting applications.

Please specify orifice size, pressure and flow when ordering.



Part #	Jet Size	Part #	Jet Size
17-003-000	PLUG	17-003-020	0.020"
17-003-001	RETAINER	17-003-021	0.021"
17-003-007	0.007"	17-003-022	0.022"
17-003-008	0.008"	17-003-025	0.025"
17-003-009	0.009"	17-003-026	0.026"
17-003-010	0.010"	17-003-027	0.027"
17-003-011	0.011"	17-003-028	0.028"
17-003-012	0.012"	17-003-031	0.031"
17-003-013	0.013"	17-003-032	0.032"
17-003-014	0.014"	17-003-033	0.033"
17-003-015	0.015"	17-003-034	0.034"
17-003-016	0.016"	17-003-035	0.035"
17-003-018	0.018"	17-003-036	0.036"
17-003-019	0.019"	17-003-038	0.038"



*If you don't see what you are looking for or just have a question, call toll free in North America 1 (877) 290-4277 or (281) 290-9950.*

# DRILLED NOZZLE FLOWS

Nozzle Number	Orifice Diam./In.	2,000 PSI	4,000 PSI	5,000 PSI	6,000 PSI	7,000 PSI	8,000 PSI	9,000 PSI
0.12	0.012	0.154	0.218	0.244	0.267	0.288	0.308	0.327
0.13	0.013	0.181	0.256	0.286	0.313	0.338	0.362	0.384
0.14	0.014	0.210	0.297	0.332	0.363	0.392	0.419	0.445
0.15	0.015	0.241	0.340	0.381	0.417	0.450	0.481	0.511
0.16	0.016	0.274	0.387	0.433	0.474	0.512	0.548	0.581
0.18	0.018	0.347	0.490	0.548	0.600	0.649	0.693	0.735
0.2	0.020	0.428	0.605	0.677	0.741	0.801	0.856	0.908
0.21	0.021	0.472	0.667	0.746	0.817	0.883	0.944	1.001
0.22	0.022	0.518	0.732	0.819	0.897	0.969	1.036	1.099
0.24	0.024	0.616	0.872	0.974	1.067	1.153	1.233	1.307
0.25	0.025	0.669	0.946	1.057	1.158	1.251	1.337	1.419
0.26	0.026	0.723	1.023	1.144	1.253	1.353	1.447	1.534
0.28	0.028	0.839	1.186	1.326	1.453	1.569	1.678	1.780
0.31	0.031	1.028	1.454	1.626	1.781	1.924	2.057	2.181
0.32	0.032	1.096	1.550	1.732	1.898	2.050	2.191	2.324
2	0.036	1.387	1.961	2.193	2.402	2.594	2.773	2.942
3	0.043	1.978	2.798	3.128	3.427	3.701	3.957	4.197
4	0.047	2.364	3.343	3.737	4.094	4.422	4.727	5.014
4.5	0.050	2.675	3.783	4.229	4.633	5.004	5.350	5.674
5	0.052	2.893	4.092	4.575	5.011	5.413	5.786	6.137
5.5	0.055	3.237	4.577	5.118	5.606	6.055	6.473	6.866
6	0.059	3.725	5.267	5.889	6.451	6.968	7.449	7.901
6.5	0.060	3.852	5.447	6.090	6.672	7.206	7.704	8.171
7	0.062	4.113	5.817	6.503	7.124	7.695	8.226	8.725
7.5	0.065	4.521	6.393	7.148	7.830	8.457	9.041	9.590
8	0.067	4.803	6.793	7.594	8.319	8.986	9.606	10.189
8.5	0.069	5.094	7.204	8.055	8.823	9.530	10.188	10.806
9	0.071	5.394	7.628	8.528	9.342	10.091	10.788	11.442
9.5	0.073	5.702	8.064	9.016	9.876	10.667	11.404	12.096
10	0.075	6.019	8.512	9.516	10.425	11.260	12.037	12.768
10.5	0.077	6.344	8.972	10.031	10.988	11.868	12.688	13.458
11	0.078	6.510	9.206	10.293	11.275	12.179	13.020	13.809
11.5	0.080	6.848	9.684	10.828	11.861	12.811	13.696	14.527
12	0.082	7.195	10.175	11.376	12.461	13.460	14.389	15.262
12.5	0.084	7.550	10.677	11.937	13.077	14.124	15.100	16.016
13	0.085	7.731	10.933	12.223	13.390	14.463	15.461	16.399
14	0.089	8.475	11.986	13.401	14.680	15.856	16.951	17.979
15	0.093	9.254	13.088	14.632	16.029	17.313	18.509	19.631
16	0.095	9.657	13.657	15.268	16.726	18.066	19.313	20.485
18	0.100	10.700	15.132	16.918	18.533	20.018	21.400	22.698
20	0.106	12.022	17.002	19.009	20.823	22.492	24.045	25.503
21	0.109	12.713	17.978	20.100	22.019	23.783	25.425	26.967
25	0.118	14.898	21.070	23.557	25.805	27.873	29.797	31.604
27	0.125	16.719	23.644	26.434	28.957	31.278	33.437	35.465
30	0.130	18.083	25.573	28.591	31.320	33.830	36.166	38.359
35	0.140	20.972	29.659	33.159	36.324	39.235	41.943	44.488
40	0.156	26.039	36.825	41.172	45.101	48.715	52.078	55.237
50	0.167	29.841	42.201	47.183	51.686	55.827	59.682	63.302
60	0.187	37.416	52.915	59.160	64.807	70.000	74.833	79.372
70	0.203	44.093	62.357	69.717	76.371	82.491	88.186	93.536
80	0.210	47.186	66.732	74.608	81.729	88.278	94.373	100.098
90	0.219	51.318	72.574	81.140	88.885	96.007	102.635	108.861
100	0.250	66.874	94.574	105.737	115.829	125.110	133.748	141.862

Nozzle Number	Orifice Diam./In.	10,000 PSI	15,000 PSI	20,000 PSI	25,000 PSI	30,000 PSI	36,000 PSI	40,000 PSI
0.12	0.012	0.345	0.422	0.487	0.545	0.597	0.654	0.689
0.13	0.013	0.404	0.495	0.572	0.639	0.700	0.767	0.809
0.14	0.014	0.469	0.574	0.663	0.741	0.812	0.890	0.938
0.15	0.015	0.538	0.659	0.761	0.851	0.932	1.021	1.077
0.16	0.016	0.612	0.750	0.866	0.968	1.061	1.162	1.225
0.18	0.018	0.775	0.949	1.096	1.226	1.343	1.471	1.550
0.2	0.020	0.957	1.172	1.353	1.513	1.658	1.816	1.914
0.21	0.021	1.055	1.292	1.492	1.668	1.828	2.002	2.110
0.22	0.022	1.158	1.418	1.638	1.831	2.006	2.197	2.316
0.24	0.024	1.378	1.688	1.949	2.179	2.387	2.615	2.756
0.25	0.025	1.495	1.831	2.115	2.364	2.590	2.837	2.991
0.26	0.026	1.617	1.981	2.287	2.557	2.801	3.069	3.235
0.28	0.028	1.876	2.297	2.653	2.966	3.249	3.559	3.752
0.31	0.031	2.299	2.816	3.252	3.635	3.982	4.363	4.599
0.32	0.032	2.450	3.001	3.465	3.874	4.243	4.649	4.900
2	0.036	3.101	3.798	4.385	4.903	5.371	5.883	6.202
3	0.043	4.424	5.418	6.256	6.995	7.662	8.394	8.848
4	0.047	5.285	6.473	7.474	8.357	9.154	10.028	10.570
4.5	0.050	5.981	7.326	8.459	9.457	10.360	11.349	11.963
5	0.052	6.469	7.923	9.149	10.229	11.205	12.275	12.939
5.5	0.055	7.238	8.864	10.235	11.443	12.536	13.732	14.475
6	0.059	8.329	10.200	11.778	13.169	14.425	15.802	16.657
6.5	0.060	8.613	10.549	12.181	13.619	14.919	16.342	17.226
7	0.062	9.197	11.264	13.007	14.542	15.930	17.450	18.394
7.5	0.065	10.109	12.380	14.296	15.983	17.509	19.180	20.217
8	0.067	10.740	13.154	15.189	16.982	18.603	20.378	21.480
8.5	0.069	11.391	13.951	16.109	18.011	19.730	21.613	22.782
9	0.071	12.061	14.772	17.057	19.070	20.890	22.884	24.122
9.5	0.073	12.750	15.615	18.031	20.159	22.084	24.191	25.500
10	0.075	13.458	16.483	19.033	21.279	23.310	25.535	26.916
10.5	0.077	14.186	17.374	20.061	22.429	24.570	26.915	28.371
11	0.078	14.556	17.828	20.586	23.016	25.212	27.619	29.113
11.5	0.080	15.312	18.754	21.655	24.211	26.522	29.053	30.625
12	0.082	16.088	19.703	22.751	25.437	27.865	30.524	32.175
12.5	0.084	16.882	20.676	23.875	26.693	29.240	32.031	33.764
13	0.085	17.286	21.171	24.446	27.332	29.941	32.798	34.573
14	0.089	18.951	23.211	26.801	29.965	32.825	35.958	37.903
15	0.093	20.693	25.344	29.265	32.719	35.842	39.263	41.387
16	0.095	21.593	26.446	30.537	34.141	37.400	40.970	43.186
18	0.100	23.926	29.303	33.836	37.830	41.440	45.396	47.851
20	0.106	26.883	32.925	38.018	42.506	46.562	51.007	53.766
21	0.109	28.426	34.815	40.200	44.946	49.235	53.935	56.852
25	0.118	33.314	40.801	47.113	52.674	57.702	63.209	66.628
27	0.125	37.384	45.786	52.869	59.109	64.751	70.931	74.768
30	0.130	40.434	49.522	57.183	63.932	70.034	76.719	80.869
35	0.140	46.894	57.433	66.318	74.146	81.223	88.976	93.788
40	0.156	58.225	71.311	82.343	92.062	100.849	110.475	116.451
50	0.167	66.726	81.723	94.365	105.503	115.573	126.604	133.452
60	0.187	83.666	102.469	118.321	132.287	144.913	158.744	167.331
70	0.203	98.595	120.754	139.435	155.893	170.772	187.071	197.190
80	0.210	105.512	129.225	149.217	166.829	182.752	200.195	211.024
90	0.219	114.750	140.539	162.281	181.435	198.752	217.722	229.499
100	0.250	149.535	183.142	211.475	236.436	259.003	283.723	299.070

# TUNGSTEN NOZZLE FLOWS

Nozzle Number	Orifice Diam./In.	2,000 PSI	4,000 PSI	5,000 PSI	6,000 PSI	7,000 PSI	8,000 PSI	9,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI	25,000 PSI	30,000 PSI
0.15	0.015	0.291	0.412	0.460	0.504	0.544	0.582	0.617	0.651	0.797	0.920	1.029	1.127
0.16	0.016	0.331	0.468	0.524	0.573	0.619	0.662	0.702	0.740	0.907	1.047	1.171	1.282
0.18	0.018	0.419	0.593	0.663	0.726	0.784	0.838	0.889	0.937	1.148	1.325	1.482	1.623
0.2	0.020	0.517	0.732	0.818	0.896	0.968	1.035	1.097	1.157	1.417	1.636	1.829	2.004
0.21	0.021	0.570	0.807	0.902	0.988	1.067	1.141	1.210	1.275	1.562	1.804	2.017	2.209
0.22	0.022	0.626	0.885	0.990	1.084	1.171	1.252	1.328	1.400	1.714	1.980	2.213	2.424
0.24	0.024	0.745	1.054	1.178	1.290	1.394	1.490	1.580	1.666	2.040	2.356	2.634	2.885
0.25	0.025	0.808	1.143	1.278	1.400	1.512	1.617	1.715	1.807	2.214	2.556	2.858	3.131
0.26	0.026	0.874	1.236	1.382	1.514	1.636	1.749	1.855	1.955	2.394	2.765	3.091	3.386
0.28	0.028	1.014	1.434	1.603	1.756	1.897	2.028	2.151	2.267	2.777	3.206	3.585	3.927
0.29	0.029	1.088	1.538	1.720	1.884	2.035	2.175	2.307	2.432	2.979	3.440	3.846	4.213
0.31	0.031	1.243	1.758	1.965	2.153	2.325	2.486	2.637	2.779	3.404	3.930	4.394	4.814
0.32	0.032	1.324	1.873	2.094	2.294	2.478	2.649	2.809	2.961	3.627	4.188	4.682	5.129
2	0.036	1.676	2.370	2.650	2.903	3.136	3.352	3.556	3.748	4.590	5.300	5.926	6.492
2_	0.039	1.967	2.782	3.110	3.407	3.680	3.934	4.173	4.399	5.387	6.221	6.955	7.619
2_	0.040	2.069	2.926	3.272	3.584	3.871	4.139	4.390	4.627	5.667	6.544	7.316	8.014
2_	0.041	2.174	3.075	3.438	3.766	4.067	4.348	4.612	4.861	5.954	6.875	7.687	8.420
3	0.043	2.391	3.382	3.781	4.142	4.474	4.783	5.073	5.347	6.549	7.562	8.455	9.262
4	0.047	2.857	4.040	4.517	4.948	5.345	5.714	6.061	6.388	7.824	9.035	10.101	11.065
4.5	0.050	3.233	4.573	5.112	5.600	6.049	6.467	6.859	7.230	8.855	10.225	11.432	12.523
4_	0.051	3.364	4.757	5.319	5.827	6.293	6.728	7.136	7.522	9.213	10.638	11.893	13.029
5	0.052	3.497	4.946	5.530	6.057	6.543	6.994	7.419	7.820	9.577	11.059	12.364	13.544
5.5	0.055	3.912	5.533	6.186	6.776	7.319	7.825	8.299	8.748	10.714	12.372	13.832	15.152
6	0.059	4.502	6.367	7.118	7.798	8.423	9.004	9.550	10.067	12.329	14.237	15.917	17.437
6.5	0.060	4.656	6.585	7.362	8.064	8.711	9.312	9.877	10.411	12.751	14.724	16.461	18.033
7	0.062	4.972	7.031	7.861	8.611	9.301	9.943	10.546	11.117	13.615	15.721	17.577	19.255
7.5	0.065	5.464	7.728	8.640	9.465	10.223	10.929	11.592	12.219	14.965	17.280	19.319	21.163
8	0.067	5.806	8.211	9.180	10.056	10.862	11.612	12.316	12.982	15.900	18.359	20.527	22.486
8.5	0.069	6.158	8.708	9.736	10.665	11.520	12.315	13.062	13.769	16.863	19.472	21.770	23.848
9	0.071	6.520	9.220	10.309	11.292	12.197	13.039	13.830	14.578	17.855	20.617	23.051	25.251
9.5	0.073	6.892	9.747	10.897	11.938	12.894	13.784	14.621	15.411	18.875	21.795	24.368	26.693
10	0.075	7.275	10.288	11.503	12.601	13.610	14.550	15.433	16.267	19.923	23.006	25.721	28.176
10.5	0.077	7.668	10.844	12.124	13.282	14.346	15.336	16.267	17.147	21.000	24.249	27.111	29.699
11	0.078	7.869	11.128	12.441	13.629	14.721	15.737	16.692	17.595	21.549	24.883	27.820	30.475
11.5	0.080	8.277	11.706	13.088	14.337	15.485	16.555	17.559	18.509	22.668	26.175	29.265	32.058
12	0.082	8.696	12.299	13.750	15.063	16.269	17.393	18.448	19.446	23.816	27.500	30.746	33.681
12.5	0.084	9.126	12.906	14.429	15.806	17.073	18.252	19.359	20.406	24.992	28.858	32.264	35.344
13	0.085	9.344	13.215	14.775	16.185	17.482	18.689	19.822	20.895	25.591	29.549	33.037	36.190
14	0.089	10.244	14.488	16.198	17.744	19.166	20.489	21.732	22.907	28.056	32.396	36.220	39.677
15	0.093	11.186	15.819	17.687	19.375	20.927	22.372	23.729	25.013	30.634	35.373	39.549	43.323
16	0.095	11.672	16.507	18.456	20.217	21.837	23.345	24.761	26.100	31.966	36.911	41.268	45.207
18	0.100	12.933	18.290	20.449	22.401	24.196	25.867	27.436	28.920	35.419	40.899	45.726	50.091
20	0.106	14.532	20.551	22.977	25.170	27.187	29.064	30.827	32.494	39.797	45.954	51.378	56.282
25	0.118	18.008	25.468	28.474	31.191	33.691	36.017	38.202	40.268	49.318	56.947	63.669	69.746
27	0.125	20.208	28.579	31.952	35.002	37.806	40.417	42.868	45.187	55.343	63.904	71.447	78.267
30	0.130	21.857	30.911	34.559	37.858	40.891	43.715	46.366	48.874	59.859	69.119	77.277	84.653
35	0.140	25.349	35.849	40.081	43.906	47.424	50.699	53.774	56.683	69.422	80.162	89.623	98.178
40	0.156	31.475	44.512	49.766	54.516	58.884	62.949	66.768	70.379	86.197	99.531	****	****
50	0.167	36.070	51.010	57.031	62.475	67.480	72.140	76.516	80.654	98.781	****	****	****
60	0.187	45.227	63.960	71.509	78.335	84.611	90.453	80.654	****	****	****	****	****
70	0.203	53.297	75.373	84.270	92.313	99.710	95.940	****	****	****	****	****	****
80	0.210	57.036	80.661	90.182	98.789	****	****	****	****	****	****	****	****
90	0.219	62.030	87.723	98.077	****	****	****	****	****	****	****	****	****
100	0.250	80.833	****	****	****	****	****	****	****	****	****	****	****