

PROPANE POWER CAPACITY FOR PIPES, VALVES, JETS AND BURNER SETS (B. Boller, 6/4/21)

ITEM	ORIFICE SIZE / I.D. - AREA	ORIFICE FUNCTION*	BTU/hour and HORSEPOWER @ GIVEN PRESSURE - PRESSURE FUNCTION (PF)*							
			1/4 PSI - 2.1446 PF		1/2 PSI - 3.0329 PF		1 PSI - 4.2661 PF		2 PSI - 6.0332 PF	
			BTU/hr	HP	BTU/hr	HP	BTU/hr	HP	BTU/hr	HP
Marty Jet / Bengie Burner	#70 / .0280 in. - 0.0006 sq. in.	2,039	4,373	2	6,184	2	8,699	3	12,302	5
1/8 in. pipe	H / 0.27 in. - 0.057 sq. in.	183,937	394,471	155	557,863	219	784,694	308	1,109,729	436
1/4 in. pipe	U / 0.36 in. - 0.104 sq. in.	352,484	755,937	297	1,069,049	420	1,503,732	591	2,126,606	836
3/8 in. pipe	1/2 / 0.49 in. - 0.191 sq. in.	650,084	1,394,170	548	1,971,640	775	2,773,323	1090	3,922,087	1,542
#47 Needle Valve	#47 / 0.0785in. - 0.00484 sq. in.	16,020	34,357	14	48,588	19	68,345	27	96,654	38
#22 Needle Valve	#22 / 0.157 in. - 0.01936 sq. in.	64,082	137,429	54	194,353	76	273,379	107	386,617	152
1/4" full-flow ball valve	0.300 in. - 0.0707 sq. in.	229,118	491,366	193	694,892	273	977,440	384	1,382,315	543
C-16, 20 Jet Burner	cumulative 0.0123 sq. in.		87,457	34	123,682	49	173,972	68	246,034	97
K-27, 42 Jet, Three Burner	cumulative 0.0259 sq. in.		183,659	72	259,731	102	365,340	144	516,671	203
K-36, 18 Jet, One Burner	cumulative 0.0111 sq. in.		78,711	31	111,313	44	156,574	62	221,431	87
K-36, 36 Jet, Two Burner	cumulative 0.0222 sq. in.		157,422	62	222,627	88	313,149	123	442,861	174
K-36, 54 Jet, Three Burner	cumulative 0.0333 sq. in.		236,133	93	333,940	131	469,723	185	664,292	261

Notes:

- * Orifice Function, Pressure Function and Altitude Factor from Ward Burner Systems orifice table (corrected: 1/4 psi = 7" WC, not 4" WC as listed by Ward)
- BTU and HP also available on-line with Anderson & Forrester BTU calculator <https://andersonforrester.com/btu-calculator/>
- Chiloquin Oregon altitude factor (elevation 4200 feet) is 0.9386*, reducing above BTU and HP by 6.1%
- C-16 (Bumblebee) calculated net effective horsepower = 3.63 (@ 5% efficiency requires 73 HP, equal to 78 HP in above chart at Chiloquin altitude)
- K-36 (#487) calculated net effective horsepower = 7.97 (@ 5% efficiency requires 159 HP, equal to 169 HP in above chart at Chiloquin altitude)
- Ignores additional friction pressure losses in piping, bends, valves and manifold
- Assumes LocoParts recommended minimum jet spacing (1.75" on center, 1" from walls) assumes adequate air flow/mixing for combustion and heat transfer