FIREFIGHTING HOSE AND NOZZLE COMPARISON CHART   2½ Inch Hose with 2½ Inch Couplings

2 1/2 Inch Fire Hose with Smooth Bore Nozzle or Bresnan Cellar Nozzle

Nozzle Type	Nozzle Size in inches	Nozzle Pressure in P.S.I.	Nozzle Flow in G.P.M.	Nozzle Reaction lbsf	Prsnl. to Advance Nozzle	Cooling Capacity in MW	Adjusted Cooling Capacity	Iowa Formula Cov. cu. ft.	Friction Loss per 100' Hose	Engine Pressure 150' Line	Engine Pressure 200' Line	Engine Pressure 250' Line	Engine Pressure 300' Line
Smooth Bore	⅞	40	144	48	1	23.6	11.8	0	4	46	48	50	52
		45	153	54	1	25.1	12.6	0	5	53	55	58	60
		50	161	60	1	26.4	13.2	0	5	58	60	63	65
		55	169	66	2	27.7	13.9	0	6	64	67	70	73
		60	176	72	2	28.9	14.5	0	6	69	72	75	78
Smooth Bore	15/16	40	165	55	1	27	13.5	0	5	48	50	53	55
		45	175	62	2	28.7	14.4	0	6	54	57	60	63
		50	185	69	2	30.4	15.2	0	7	61	64	68	71
		55	194	76	3	31.8	15.9	0	8	67	71	75	79
		60	202	83	3	33.1	16.6	0	8	72	76	80	84
Smooth Bore	1	40	187	63	2	30.7	15.4	0	7	51	54	58	61
		45	199	71	2	32.6	16.3	0	8	57	61	65	69
		50	210	79	3	34.5	17.3	0	9	64	68	73	77
		55	220	86	3	36.1	18.1	0	10	70	75	80	85
		60	230	94	3	37.7	18.9	0	11	77	82	88	93
Smooth Bore	1⅛	40	238	79	3	39	19.5	0	11	57	62	68	73
		45	252	89	3	41.3	20.7	0	13	65	71	78	84
		50	266	99	2-fixed	43.6	21.8	0	14	71	78	85	92
		55	279	109	2-fixed	45.8	22.9	0	16	79	87	95	103
		60	291	119	♣	47.7	23.9	0	17	86	94	103	111
Smooth Bore	1¼	40	294	98	2-fixed	48.2	24.1	0	17	66	74	83	91
		45	311	110	2-fixed	51	25.5	0	19	74	83	93	102
		50	328	123	♣	53.8	26.9	0	22	83	94	105	116
		55	344	135	♣	56.4	28.2	0	24	91	103	115	127
		60	359	147	♣	58.9	29.5	0	26	99	112	125	138
Bresnan Cellar	2½	100	280	0	1	45.9	23+	?	16	124	132	140	148

Nozzle Reaction lbsf (force) calculations: NR for Solid Stream Nozzles = 1.57 X d² X NP   NR for Fog Stream Nozzles = 0.0505 X Q X √NP   (Q = Flow in Gallons Per Minute)
Personnel to Advance Nozzle: To 60± lbsf = 1 firefighter; To 75± lbsf = 2 firefighters; To 95± lbsf = 3 firefighters; To 110± lbsf = 2 firefighters in a fixed position only; >110 lbsf = Good Luck
Cooling Capacity (Theoretical) in MW = Flow in kg/second X 2.6 MJ/kg   For reference: A modern living room fire produces a Heat Release Rate of approximately 9 MW to 12 MW
Adjusted Cooling Capacity in MW = Cooling Capacity in MW X Efficiency Factor (0.5 for straight streams and 0.75 for fog streams)   Note: Efficiency may at times be as low as 20% (0.2)
Iowa Formula Coverage in cubic feet (for knock down of a closed compartment fire in 30 seconds using an Indirect Attack with water fog) = Nozzle Flow in G.P.M. X 100
Friction Loss in P.S.I. per 100' of Hose = C X (Q/100)²   The coefficient "C" is an adjusted figure reflecting field conditions (the theoretical coefficient is used for results in parenthesis)
Adjusted and Theoretical Friction Loss Coefficients used for hose and engine pressure calculations: 1¾" Hose 12 (15.5)   2" Hose 6 (8)   2½ Hose 2 (2)   3" Hose 0.8 (1)
† Fog stream efficiency diminishes at nozzle pressures <100 P.S.I. as droplet size increases (>1mm) and droplet velocity decreases. ‡Short pulse fog use is limited to flows ≤150 G.P.M.