

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

### 2 1/2 Inch Fire Hose with Fixed Pressure (Automatic) Combination Nozzle or Fixed Flow Combination Nozzle

Nozzle Type	Nozzle Size in inches	Nozzle Pressure in P.S.I.	Nozzle Flow in G.P.M.	Nozzle Reaction lbf	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
Combination		50	150	54	1	24.6	12.3/†	†	5	58	60	63	65
		75	150	66	2	24.6	12.3/†	†	5	83	85	88	90
		100	150	76	3	24.6	12.3/18.5	15,000	5	108	110	113	115
Combination		50	175	62	2	28.7	14.4/†±	†	6	59	62	65	68
		75	175	77	3	28.7	14.4/†±	†	6	84	87	90	93
		100	175	88	3	28.7	14.4/21.5±	17,500	6	109	112	115	118
Combination		50	185	66	2	30.4	15.2/†±	†	7	61	64	68	71
		75	185	81	3	30.4	15.2/†±	†	7	86	89	93	96
		100	185	93	3	30.4	15.2/22.8±	18,500	7	111	114	118	121
Combination		50	200	71	2	32.8	16.4/†±	†	8	62	66	70	74
		75	200	87	3	32.8	16.4/†±	†	8	87	91	95	99
		100	200	101	2-fixed	32.8	16.4/24.6±	20,000	8	112	116	120	124
Combination		50	250	89	3	41	20.5/†±	†	13	70	76	83	89
		75	250	109	2-fixed	41	20.5/†±	†	13	95	101	108	114
		100	250	126	♣	41	20.5/30.8±	25,000	13	120	126	133	139
Combination		50	325	116	♣	53.3	26.7/†±	†	21	82	92	103	113
		75	325	142	♣	53.3	26.7/†±	†	21	107	117	128	138
		100	325	164	♣	53.3	26.7/40†	32,500	21	132	142	153	163
Navy Fog on Applicator													
	2½	100	95	48	1	15.6	11.7	?	2	103	104	105	106

Nozzle Reaction lbf (force) calculations: NR for Solid Stream Nozzles =  $1.57 \times d^2 \times NP$  NR for Fog Stream Nozzles =  $0.0505 \times Q \times NP$  (Q = Flow in Gallons Per Minute)  
 Personnel to Advance Nozzle: To 60± lbf = 1 firefighter; To 75± lbf = 2 firefighters; To 95± lbf = 3 firefighters; To 110± lbf = 2 firefighters in a fixed position only; >110 lbf = 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 =  $C \times (Q/100)^2$  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: 1½" 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.