

Updated on 01/31/20 please see the \* (.8 to .08)

**Denver Fire Department**  
**Safety and Training**  
**Friction Loss Pump Chart**  
 Revised 2019

1-3/4" HOSE					15.5 Q <sup>2</sup>	5" HOSE .08* Q <sup>2</sup>	
Nozzle Type	TIP SIZE	GPM	FL/100'	NP		GPM	FL/100'
Smooth Bore	15/16"	185	53	50		1000	8
COMBINATION	N/A	175	47	75		1500	18
FOG	N/A	185	53	75		2000	32
1-1/2" BRESNAN	N/A	96	14	100		2500	50
2-1/2" HOSE					2Q <sup>2</sup>		
NOZZLES TYPE	TIP SIZE	GPM	FL/100'	NP			
SMOOTH BORE	1"	210	9	50			
SOLID STREAM	1-1/8"	266	14	50			
	1-1/4"	328	21	50			
COMBINATION	N/A	250	13	100			
FOG	N/A	250	13	75			
	N/A	300	18	75			
2-1/2" BRESNAN	N/A	280	16	100			
2-1/2" LIGHT WEIGHT HOSE					1.75 Q <sup>2</sup>		
NOZZLE TYPE	TIP SIZE	GPM	FL/100'	NP			
SMOOTH BORE	1 1/8"	266	13	50			
SOLID STREAM	1 1/4"	328	19	50			
COMBINATION FOG	N/A	250	11	75			
2" LIGHT WEIGHT GREEN HOSE					7Q <sup>2</sup>		
NOZZLE TYPE	TIP SIZE	GPM	FL/100'	NP			
SMOOTH BORE	1"	210	31	50			
COMBINATION FOG	N/A	185	24	75			
MASTER STREAMS							
NOZZLE SIZE	GPM	NP	2 1/2" 2Q <sup>2</sup>	FL/100' MULTIPLE LINES	3" .8Q <sup>2</sup>		
TIP SIZE			ONE 2-1/2"	TWO 2 1/2"	ONE 3"	TWO 3"	
1-3/8"	502	80	50	13	20	5	
1-1/2"	598	80	72	18	29	7	
1-3/4"	812	80	132	33	53	13	
2"	1062	80	226	56	90	23	
FOG	500	100	50	12	20	5	
FOG	1000	100	200	50	80	20	
APPLIANCES	FL	MISCELLANEOUS					
BRESNAN(S)	3\5	SPRINKLER SYTEM: 150 PSI PUMP IN "VOLUME"					
SIAMESE/WYE	5	RELAY PUMPING: SUPPLY ENGINE IN "VOLUME"					
MULTIVERSAL	10	RECEIVING ENGINE 20-80 PSI INTAKE PRESSURE					
DECK GUN	10	TRANSFER VALVE; WHEN TO CHANGE OVER					
PRE PIPED LADDER	100	GREATER THAN 70% CAPACITY: PUMP IN "VOLUME"					
PRE PIPED TOWER	62	LESS THAN 70% CAPACITY: PUMP IN "PRESSURE"					
STANDPIPE	25						
ELEVATION/FEET	0.5	FOAM OPERATIONS: 200 PSI AT THE EDUCTOR,					
ELEVATION/FLOOR	5	300' MAX 1-3/4" FROM THE EDUCTOR, 125 GPM FOG					

0-10% DROP FROM STATIC TO RESIDUAL=ADD 3 TIMES CURRENT GPM OUTPUT  
 11-15% DROP FROM STATIC TO RESIDUAL=ADD 2 TIMES CURRENT GPM OUTPUT  
 16-20% DROP FROM STATIC TO RESIDUAL=ADD 1 TIMES CURRENT GPM OUTPUT