

FRICION AND DESIGN TABLES



FRICION LOSS EXPRESSED AS PERCENTAGE OF LENGTH

PIPE SIZE	FLOW IN M ³ PER HOUR																									
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
40	2.2	3.3	5.4	7.8	10.0	13.5																				
50	0.6	1.0	1.6	2.2	3.0	3.8	4.7	5.7	6.8	8.0	9.3	11.0	12.0													
70					0.6	0.7	1.0	1.2	1.4	1.6	1.9	2.2	2.4	2.7	3.0	3.4	3.8	4.2	4.5	5.0	5.4	5.8	6.2	6.7		
76									0.9	0.8	1.0	1.2	1.4	1.6	1.8	1.9	2.2	2.4	2.6	2.9	3.2	3.4	3.7	4.0	4.6	
89														0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.7	1.8	2.0	
102																				0.6	0.7	0.8	0.8	0.9		
108																					0.6	0.6	0.7	0.7		
mm	27	28	29	30	31	32	33	34	35	36	37	38	40	42	44	46	48	50	53	55	58	60	65	70		
70	7.2	7.8	8.3	8.9	9.4	10.0	11.0																			
76	4.3	4.9	5.2	5.6	6.0	6.3	6.7	7.0	7.4	7.8	8.2	8.7	9.5	10.0	11.0	12.0										
89	2.1	2.3	2.4	2.6	2.7	2.9	3.1	3.2	3.4	3.6	3.8	4.0	4.4	4.8	5.2	5.7	6.1	6.6	7.4	7.8	8.8	9.3	11.0	12.0		
102	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.9	3.1	3.4	3.7	4.1	4.4	5.0	5.8		
108	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.85	2.0	2.2	2.4	2.6	2.9	3.1	3.4	3.6	4.2	4.8		
127													0.77	0.84	0.9	1.0	1.1	1.17	1.3	1.4	1.5	1.6	1.9	2.2		
152																						0.7	0.8	0.9		
159																								0.7		
mm	75	80	85	90	95	100	110	120	130	140	150	160	170	180	190	200	220	240	260	280	300	320	350	375		
102	6.5	7.4	8.0	9.2	10.0	11.0																				
108	5.4	6.1	6.9	7.6	8.5	9.4	11.2	13																		
127	2.5	2.8	3.2	3.5	3.9	4.3	5.1	6.0	7.0	8.0	9.0	10.0	11.0	13.0												
152	1.0	1.2	1.3	1.5	1.6	1.7	2.1	2.5	2.8	3.3	3.7	4.2	4.3	5.2	5.8	6.3	7.5	8.8	11.0	12.0	13.0					
159	0.8	0.9	1.0	1.2	1.3	1.4	1.8	2.0	2.3	2.6	3.0	3.4	3.7	4.2	4.6	5.1	6.0	7.1	8.3	9.5	11.0	12.0	14.0	16.0		
194									0.8	1.0	1.1	1.2	1.3	1.5	1.7	2.0	2.3	2.6	3.0	3.4	3.8	4.5	5.2			

MAXIMUM SPRINKLER LINE LENGTH FOR GIVEN PIPE SIZE, NOZZLE, NOZZLE PRESSURE AND 20% PRESSURE LOSS

PRECIPITATION RATE (MM/HR) ON INDICATED SPACING											
Spacing 12x12m	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21
Spacing 12x18m	4	5	6	7	8	9	10	11	12	13	14
Capacity m ³ /hr	0.86	1.07	1.30	1.51	1.72	1.94	2.16	2.38	2.60	2.80	3.00
Nozzle size	9/64	5/32	9/64x3/32	5/32x3/32	11/64x3/32	3/16x3/32	3/16x1/8	3/16x1/8	13/64x1/8	7/32x1/8	7/32x1/8
Pressure kPa	300	310	320	320	320	310	280	340	320	300	360
PIPE SIZE	MAXIMUM LENGTH (IN M) OF SPRINKLER LINE FOR INDICATION PIPE SIZE										
40	120	96	84	72	72	60	48	-	-	-	-
50	168	144	132	120	108	96	84	84	72	72	72
70	324	276	252	228	204	192	168	168	156	144	144
76	384	336	300	276	252	228	204	204	180	168	168
89	516	444	396	360	336	300	264	264	252	228	228
102	660	576	516	468	432	396	348	348	324	300	300
108	732	636	564	504	468	420	384	384	348	324	324

PRECIPITATION RATE (MM/HR) ON INDICATED SPACING											
Spacing 18 x 18m	5	6	7	8	9	10	11	12	14		
Capacity m ³ /hr	1.62	1.94	2.27	2.59	2.92	3.24	3.56	3.89	4.53		
Nozzle size	5/32x3/32	3/16x3/32	3/16x1/8	13/16x1/8	7/32x1/8	15/64x1/8	1/4x1/8	1/4x1/8	9/32x1/8		
Pressure kPa	380	310	310	320	320	350	320	390	360		
PIPE SIZE	MAXIMUM LENGTH (IN M) OF SPRINKLER LINE FOR INDICATION PIPE SIZE										
40	72	60	48	-	-	-	-	-	-	-	-
50	162	126	108	108	90	90	90	72	72		
70	228	252	216	198	180	180	162	162	144		
76	360	288	270	234	216	216	180	198	162		
89	486	396	360	324	288	288	252	252	234		
102	612	504	468	414	378	378	342	342	288		
108	666	558	504	450	414	396	360	378	324		

Example: for friction loss in mainline (first table).

- Required to know:** Friction loss in 108mm pipe for 40m³/h flow? Go to 40 as circled above then go to line marked 108 and horizontally to 1.7 circled i.e. for 100m of 108mm pipe the friction loss is 1.7m

- Required to know:** What pipe size to use if 17 sprinklers are used on 12m spacing at 1.51m³ each? Look under capacity 1.51m³/h down to pipe size 70mm and read 228 which is longer that 17 x 12 = 204 therefore 70mm pipe is recommended