Friction loss expressed as percentage of pipe length

Pipe size (mm)	Flow in m³ 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	12											
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
	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	11																	
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	11	12								
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	12
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
																						0.7	0.8	0.9
																								0.7
	75	**80**	**85**	**90**	**95**	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**220**	**240**	**260**	**280**	**300**	**320**	**350**	**375**	**400**
102	6.5	7.4	8.2	9.2	10	11																		
108	5.4	6.1	6.9	7.6	8.5	9.4	11.2	13.0																
127	2.5	2.8	3.2	3.5	3.9	4.3	5.1	6.0	7.0	8.0	9.0	10	11	13										
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	12	13			
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	12	14	16	19
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	6.0

Example for friction loss in mainline:

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

Maximum sprinklerline length for given pipe size, nozzle, nozzle pressure and 20% pressure loss											
Precipitation rate (mm/h) on indicated spacing											
Sprinkler spacing 12 x 12m	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21
Sprinkler spacing 12 x 18m	4	5	6	7	8	9	10	11	12	13	14
Capacity (m^3/h)	0.86	1.07	1.30	1.51	1.72	1.94	2.16	2.38	2.60	2.80	3.00
Nozzle sizes (")	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 (mm)	**Maximum length (in m) of sprinklerline for indicated 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/h) on indicated spacing											
Sprinkler spacing 18x18m	5	6	7	8	9	10	11	12	14		
Capacity (m^3/h)	1.62	1.94	2.27	2.59	2.92	3.24	3.56	3.89	4.53		
Nozzle sizes (")	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 (mm)	**Maximum length (in m) of sprinklerline for indicated 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 determination of pipe size:

Required to know: What pipe size to use if 17 sprinklers are used on 12m spacing at 1.51m^3/h each? Look under capacity 1.51m^3/h down to pipe size 70mm and read 228 which is longer than 17 x 12 = 204 therefore 70mm pipe is recommended