



Computation of Equivalent Pipe Diameter

Use the table below to compute the pipe diameter equivalent in flow capacity to two parallel pipes.

The computation makes the following assumptions:

- 1) Pipes are circular in geometry
- 2) Slope and Manning's coefficient are the same
- 3) Pipe sizes used are industry standard diameters

The following is the equivalent pipe diameter formula using Manning's equation.

$$D_{equiv} = \left(D_1^{8/3} + D_2^{8/3} \right)^{3/8}$$

$$D_2 = \left(D_{equiv}^{8/3} - D_1^{8/3} \right)^{3/8}$$

Equivalent Pipe Diameter (inch) Table																						
Diameter (D ₁)	Diameter (D ₂)																					
	6	8	10	12	15	18	21	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120
6	8	10	12	15	16	21	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120	132
8	10	12	12	15	16	21	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120	132
10	12	12	15	15	18	21	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120	132
12	15	15	15	16	18	21	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120	132
15	16	16	18	18	21	24	24	27	30	33	36	39	42	48	54	60	72	84	96	108	120	132
18	21	21	21	21	24	24	27	30	33	33	36	39	42	48	54	60	72	84	96	108	120	132
21	24	24	24	24	24	27	30	30	33	36	39	39	42	48	54	60	72	84	96	108	120	132
24	27	27	27	27	27	30	30	33	36	36	39	42	48	48	54	60	72	84	96	108	120	132
27	30	30	30	30	30	33	33	36	36	39	42	42	48	48	54	60	72	84	96	108	120	132
30	33	33	33	33	33	33	36	36	39	39	42	48	48	48	54	60	72	84	96	108	120	132
33	36	36	36	36	36	36	39	39	42	42	48	48	48	54	54	60	72	84	96	108	120	132
36	39	39	39	39	39	39	39	42	42	48	48	48	54	54	60	72	72	84	96	108	120	132
39	42	42	42	42	42	42	42	48	48	48	48	54	54	54	60	72	72	84	96	108	120	132
42	48	48	48	48	48	48	48	48	48	48	54	54	54	60	60	72	72	84	96	108	120	132
48	54	54	54	54	54	54	54	54	54	54	54	60	60	60	72	72	72	84	96	108	120	132
54	60	60	60	60	60	60	60	60	60	60	60	72	72	72	72	72	84	84	96	108	120	132
60	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	84	84	96	96	108	120	132
72	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	96	96	108	120	132
84	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	108	108	120	120	132
96	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	120	120	132	
108	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	132	132		
120	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132	132				

Illustrative Examples:

- 1) Equivalent pipe size for a 30" pipe and a parallel 24" pipe to the closest standard size 36" standard size parallel pipe
- 2) The parallel pipe size for an existing 36" pipe to provide capacity that of a 72" pipe 54" standard size parallel pipe