

Rural & Irrigation Pipe Systems

Polyethylene (1/2) 13mm to (2) 50mm



PIPE FLOW CALCULATOR

Three factors should be known before an appropriate choice of PE pipe can be made:

1. The length of the pipeline.
2. The quantity of water required.
3. Nett pressure - taking into account available head, differences in level over pipeline length and discharge pressure.

- Notes:**
1. Add Static Lift (elevation) to final Pump Head requirement.
 2. Calculator is for open ended pipeline.
 3. Operating temperature 20°C.

EXAMPLES OF USE OF PIPELINE FLOW CALCULATOR

- a. A 2000m long pipeline on flat terrain requires a discharge of 50 litres per minute at its end. What pumping pressure is required to achieve this if (2) 50mm Rural Pipe is used?
Answer: From the tables, required pumping pressure is 100 kPa (10m).
- b. If the above pipeline discharges into a tank 10m high, what pumping pressure is required?
Answer: 10m (previously calculated) + 10m tank height = 20m
- c. A pump operating at 300 kPa and delivering 42 litres/minute is to be used to convey water 1000m to a dam. What size pipe is required?
Answer: (1/4) 32mm pipe

Pump Req. Head m	Pump Req. Head kPa	Rural Bore Diameter in	Rural Bore Diameter mm	Pipeline Length m	Flow Velocity m/sec	Discharge at Pipeline End L/min	Pump Req. Head m	Pump Req. Head kPa	Rural Bore Diameter in	Rural Bore Diameter mm	Pipeline Length m	Flow Velocity m/sec	Discharge at Pipeline End L/min	Pump Req. Head m	Pump Req. Head kPa	Rural Bore Diameter in	Rural Bore Diameter mm	Pipeline Length m	Flow Velocity m/sec	Discharge at Pipeline End L/min
10	100	(1/2)	13	100	0.9	7	20	200	(1/2)	13	100	1.4	11	30	300	(1/2)	13	100	1.7	14
				500	0.4	3					500	0.5	4					500	0.7	5
				1000	0.2	2					1000	0.4	3					1000	0.5	4
				2000	0.2	1					2000	0.2	2					2000	0.3	2
		(3/4)	19	100	1.2	21			(3/4)	19	100	1.8	30			(3/4)	19	100	2.3	38
				500	0.5	8					500	0.7	12					500	0.9	15
				1000	0.3	6					1000	0.5	8					1000	0.6	10
				2000	0.2	4					2000	0.3	6					2000	0.4	7
		(1)	25	100	1.5	43			(1)	25	100	2.2	64			(1)	25	100	2.7	80
				500	0.6	17					500	0.9	26					500	1.1	32
				1000	0.4	12					1000	0.6	17					1000	0.8	22
				2000	0.3	8					2000	0.4	12					2000	0.5	15
		(1 1/4)	32	100	1.7	84			(1 1/4)	32	100	2.5	124			(1 1/4)	32	100	3.2	154
				500	0.7	34					500	1.0	50					500	1.3	63
				1000	0.5	23					1000	0.7	34					1000	0.9	43
				2000	0.3	15					2000	0.5	23					2000	0.6	29
		(1 1/2)	38	100	2.0	133			(1 1/2)	38	100	2.9	195			(1 1/2)	38	100	3.6	244
				500	0.8	54					500	1.2	80					500	1.5	100
				1000	0.5	36					1000	0.8	54					1000	1.0	68
				2000	0.4	25					2000	0.5	36					2000	0.7	46
		(2)	50	100	2.4	277			(2)	50	100	3.5	406			(2)	50	100	4.3	506
				500	1.0	113					500	1.4	167					500	1.8	209
				1000	0.7	77					1000	1.0	113					1000	1.2	142
				2000	0.4	52					2000	0.7	77					2000	0.8	96
40	400	(1/2)	13	100	2.1	16	50	500	(1/2)	13	100	2.3	17	60	600	(1/2)	13	100	2.5	20
				500	0.8	6					500	0.9	7					500	1.0	8
				1000	0.5	4					1000	0.6	5					1000	0.7	5
				2000	0.4	3					2000	0.4	3					2000	0.5	4
		(3/4)	19	100	2.6	45			(3/4)	19	100	3.0	51			(3/4)	19	100	3.3	56
				500	1.1	18					500	1.2	21					500	1.3	23
				1000	0.7	12					1000	0.8	14					1000	0.9	15
				2000	0.5	8					2000	0.6	9					2000	0.6	10
		(1)	25	100	3.2	94			(1)	25	100	3.6	106			(1)	25	100	4.0	117
				500	1.3	38					500	1.5	43					500	1.6	48
				1000	0.9	26					1000	1.0	29					1000	1.1	32
				2000	0.6	17					2000	0.7	20					2000	0.8	22
		(1 1/4)	32	100	3.7	181			(1 1/4)	32	100	4.2	205			(1 1/4)	32	100	4.7	226
				500	1.5	74					500	1.7	84					500	1.9	93
				1000	1.0	50					1000	1.2	57					1000	1.3	63
				2000	0.7	34					2000	0.8	39					2000	0.9	43
		(1 1/2)	38	100	4.2	286			(1 1/2)	38	100	4.8	323			(1 1/2)	38	100	5.3	357
				500	1.7	118					500	2.0	133					500	2.2	147
				1000	1.2	80					1000	1.3	91					1000	1.5	100
				2000	0.8	54					2000	0.9	61					2000	1.0	68
		(2)	50	100	5.1	593			(2)	50	100	5.7	672			(2)	50	100	6.3	738
				500	2.1	245					500	2.4	277					500	2.6	307
				1000	1.4	167					1000	1.6	188					1000	1.8	209
				2000	1.0	113					2000	1.1	128					2000	1.2	142
70	700	(1/2)	13	100	2.8	22	80	800	(1/2)	13	100	3.0	24	90	900	(1/2)	13	100	3.2	25
				500	1.1	9					500	1.2	10					500	1.3	10
				1000	0.7	6					1000	0.8	6					1000	0.9	7
				2000	0.5	4					2000	0.5	4					2000	0.6	5
		(3/4)	19	100	3.6	61			(3/4)	19	100	3.9	66			(3/4)	19	100	4.1	70
				500	1.5	25					500	1.6	27					500	1.7	29
				1000	1.0	17					1000	1.1	18					1000	1.1	19
				2000	0.7	11					2000	0.7	12					2000	0.8	13
		(1)	25	100	4.4	127			(1)	25	100	4.7	137			(1)	25	100	5.0	146
				500	1.8	52					500	1.9	56					500	2.1	60
				1000	1.2	35					1000	1.3	38					1000	1.4	41
				2000	0.8	24					2000	0.9	26					2000	0.9	28
		(1 1/4)	32	100	5.1	246			(1 1/4)	32	100	5.4	265			(1 1/4)	32	100	5.8	282
				500	2.1	101					500	2.2	109					500	2.4	116
				1000	1.4	69					1000	1.5	74					1000	1.6	79
				2000	1.0	47					2000	1.0	50					2000	1.1	54
		(1 1/2)	38	100	5.7	388			(1 1/2)	38	100	6.1	418			(1 1/2)	38	100	6.5	445
				500	2.4	160					500	2.5	173					500	2.7	184
				1000	1.6	109					1000	1.7	118					1000	1.8	125
				2000	1.1	74					2000	1.2	80					2000	1.3	85
		(2)	50	100	6.9	804			(2)	50	100	7.4	864			(2)	50	100	7.9	918
				500	2.9	334					500	3.1	359					500	3.3	383
				1000	1.9	227					1000	2.1	245					1000	2.2	262
				2000	1.3	155					2000	1.4	167					2000	1.5	178

GENERAL CONVERSION TABLE

Pressure	1 kPa	=	0.145 psi
	1 atm	=	101.3 kPa
	1 psi	=	2.31 ft/head (water)

Flow/Discharge	1 m ³ /hour	=	3.67 gal/minute
	1 gal/minute	=	0.272 m ³ /hour
	1 gal/minute	=	0.0756 L/sec
	1 L/sec	=	13.2 gal/minute
	1 L/minute	=	0.22 gal/minute

Volume	1 L	=	0.22 gallons
	1 gallon	=	4.54 L
	1 m ³	=	35.31 feet ³
	1 m ³	=	220.2 gallons

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