

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 2000m long pipeline on flat terrain requires a discharge of 55 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).
- If the above pipeline discharges into a tank 10m high, what pumping pressure is required?
Answer: 10m (previously calculated) + 10m tank height = 20m
- 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 1/4) 32mm pipe

Pump Req. Head m	Pump Req. Head kPa	Rural Bore Diameter "	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 "	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 "	Rural Bore Diameter mm	Pipeline Length m	Flow Velocity m/sec	Discharge at Pipeline End L/min
10	100	(1/2)	13	100	2.1	16	20	200	(1/2)	13	100	1.4	11	30	300	(1/2)	13	100	1.7	13
				500	0.8	6					500	0.5	4					500	0.7	5
				1000	0.5	4					1000	0.4	3					1000	0.5	4
				2000	0.4	3					2000	0.2	2					2000	0.3	24
		(3/4)	19	100	2.6	45			(3/4)	19	100	1.8	31	(3/4)	19	100	2.3	39		
				500	1.1	18					500	0.7	12				500	0.9	16	
				1000	0.7	12					1000	0.5	8				1000	0.6	11	
				2000	0.5	8					2000	0.3	6				2000	0.4	7	
		(1)	25	100	3.2	98			(1)	25	100	2.2	67	(1)	25	100	2.7	83		
				500	1.3	40					500	0.9	27				500	1.1	34	
				1000	0.9	27					1000	0.6	18				1000	0.8	23	
				2000	0.6	18					2000	0.4	12				2000	0.5	15	
		(1 1/4)	32	100	3.7	176			(1 1/4)	32	100	2.5	120	(1 1/4)	32	100	3.2	151		
				500	1.5	72					500	1.0	49				500	1.3	61	
				1000	1.0	49					1000	0.7	33				1000	0.9	42	
				2000	0.7	33					2000	0.5	22				2000	0.6	28	
		(1 1/2)	38	100	4.2	288			(1 1/2)	38	100	2.9	197	(1 1/2)	38	100	3.6	245		
				500	1.7	118					500	1.2	80				500	1.5	101	
				1000	1.2	80					1000	0.8	54				1000	1.0	68	
				2000	0.8	54					2000	0.5	37				2000	0.7	46	
		(2)	50	100	5.1	618			(2)	50	100	3.5	423	(2)	50	100	4.3	528		
				500	2.1	255					500	1.4	173				500	1.8	218	
				1000	1.4	173					1000	1.0	118				1000	1.2	148	
				2000	1.0	118					2000	0.7	80				2000	0.8	100	
40	400	(1/2)	13	100	2.8	16	50	500	(1/2)	13	100	2.3	18	60	600	(1/2)	13	100	2.5	20
				500	0.8	7					500	0.9	7				500	1.0	8	
				1000	0.6	5					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	50			(3/4)	19	100	3.0	51	(3/4)	19	100	3.3	57		
				500	1.1	148					500	1.2	21				500	1.3	23	
				1000	0.7	13					1000	0.8	14				1000	0.9	16	
				2000	0.5	9					2000	0.6	9				2000	0.6	11	
		(1)	25	100	3	90			(1)	25	100	3.6	110	(1)	25	100	4.0	122		
				500	1.3	39					500	1.5	45				500	1.6	50	
				1000	0.9	27					1000	1.0	31				1000	1.1	34	
				2000	0.6	19					2000	0.7	21				2000	0.8	23	
		(1 1/4)	32	100	3.6	173			(1 1/4)	32	100	4.2	199	(1 1/4)	32	100	4.7	220		
				500	1.5	71					500	1.7	82				500	1.9	91	
				1000	1	49					1000	1.2	55				1000	1.3	61	
				2000	0.7	33					2000	0.8	38				2000	0.9	42	
		(1 1/2)	38	100	4.1	312			(1 1/2)	38	100	4.8	325	(1 1/2)	38	100	5.3	359		
				500	1.7	115					500	2.0	134				500	2.2	148	
				1000	1.2	79					1000	1.3	91				1000	1.5	101	
				2000	0.8	54					2000	0.9	62				2000	1.0	68	
		(2)	50	100	4.8	563			(2)	50	100	5.7	696	(2)	50	100	6.3	768		
				500	2	246					500	2.4	289				500	2.6	319	
				1000	1.4	169					1000	1.6	197				1000	1.8	218	
				2000	1	117					2000	1.1	134				2000	1.2	148	
70	700	(1/2)	13	100	2.8	22	80	800	(1/2)	13	100	3.0	23	90	900	(1/2)	13	100	3.2	25
				500	1.1	9					500	1.2	9				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	62			(3/4)	19	100	3.9	67	(3/4)	19	100	4.1	71		
				500	1.5	25					500	1.6	27				500	1.7	29	
				1000	1.0	17					1000	1.1	18				1000	1.1	20	
				2000	0.7	12					2000	0.7	12				2000	0.8	13	
		(1)	25	100	4.4	133			(1)	25	100	4.7	143	(1)	25	100	5.0	152		
				500	1.8	54					500	1.9	59				500	2.1	62	
				1000	1.2	37					1000	1.3	40				1000	1.4	42	
				2000	0.8	25					2000	0.9	27				2000	0.9	29	
		(1 1/4)	32	100	5.1	239			(1 1/4)	32	100	5.4	258	(1 1/4)	32	100	5.8	275		
				500	2.1	98					500	2.2	106				500	2.4	113	
				1000	1.4	67					1000	1.5	72				1000	1.6	77	
				2000	1.0	45					2000	1.0	49				2000	1.1	52	
		(1 1/2)	38	100	5.7	391			(1 1/2)	38	100	6.1	420	(1 1/2)	38	100	6.5	448		
				500	2.4	161					500	2.5	174				500	2.7	185	
				1000	1.6	110					1000	1.7	118				1000	1.8	126	
				2000	1.1	74					2000	1.2	80				2000	1.3	86	
		(2)	50	100	6.9	840			(2)	50	100	7.4	900	(2)	50	100	7.9	960		
				500	2.9	347					500	3.1	374				500	3.3	399	
				1000	1.9	237					1000	2.1	255				1000	2.2	272	

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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