KS650.380 Pipe Flow Computations

(a) General

Table KS3-1 can be used to determine pipe flow for polyvinyl chloride (PVC) hooded or canopy inlets. The values within the table were derived from the pipe flow equation at the bottom of the page. For pipes not in the table, use the equation to compute pipe flow.

Table KS3-1 Head Discharge for PVC Pipe Hooded Inlets Full Pipe Flow Condition

n = .009

Head in Ft.		5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Barrel Dia.	Length	Q (Discharge in cfs)															
6"	40	1.9	2.1	2.2	2.4	2.5	2.7	2.8	2.9	3.0	3.2	3.3	3.4	3.5	3.6	3.7	3.8
	50	1.8	2.0	2.1	2.3	2.4	2.5	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6
	60	1.7	1.9	2.0	2.2	2.3	2.4	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.2	3.3	3.4
	70	1.6	1.8	1.9	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3
	80	1.6	1.7	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2
	90	1.5	1.7	1.8	1.9	2.0	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	3.0	3.0
	100	1.5	1.6	1.7	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	2.9
	110	1.4	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.8
	120	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.8
8"	40	3.6	3.9	4.3	4.6	4.8	5.1	5.3	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2
	50	3.5	3.8	4.1	4.4	4.6	4.9	5.1	5.4	5.6	5.8	6.0	6.2	6.4	6.6	6.7	6.9
	60	3.3	3.6	3.9	4.2	4.5	4.7	4.9	5.2	5.4	5.6	5.8	6.0	6.1	6.3	6.5	6.7
	70	3.2	3.5	3.8	4.1	4.3	4.5	4.8	5.0	5.2	5.4	5.6	5.8	5.9	6.1	6.3	6.4
	80	3.1	3.4	3.7	3.9	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.7	5.9	6.1	6.2
	90	3.0	3.3	3.6	3.8	4.0	4.3	4.5	4.7	4.9	5.0	5.2	5.4	5.6	5.7	5.9	6.0
	100	2.9	3.2	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.2	5.4	5.6	5.7	5.9
	110	2.9	3.1	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1	5.3	5.4	5.6	5.7
	120	2.8	3.0	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6
10"	40	5.9	6.5	7.0	7.5	7.9	8.2	8.7	9.1	9.5	9.9	10.2	10.5	10.9	11.2	11.5	11.8
	50	5.7	6.2	6.7	7.2	7.6	8.1	8.5	8.8	9.2	9.5	9.9	10.2	10.5	10.8	11.1	11.4
	60	5.5	6.1	6.5	7.0	7.4	7.8	8.2	8.6	8.9	9.2	9.6	9.9	10.2	10.5	10.8	11.0
	70	5.4	5.9	6.3	6.8	7.2	7.6	8.0	8.3	8.6	9.0	9.3	9.6	9.9	10.2	10.4	10.7
	80	5.2	5.7	6.2	6.6	7.0	7.4	7.7	8.1	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.4
	90	5.1	5.6	6.0	6.4	6.8	7.2	7.5	7.9	8.2	8.5	8.8	9.1	9.4	9.6	9.9	10.2
	100	5.0	5.4	5.9	6.3	6.6	7.0	7.3	7.7	8.0	8.3	8.6	8.9	9.1	9.4	9.7	9.9
	110	4.8	5.3	5.7	6.1	6.5	6.8	7.2	7.5	7.8	8.1	8.4	8.7	8.9	9.2	9.4	9.7
	120	4.7	5.2	5.6	6.0	6.3	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.7	9.0	9.2	9.5
12"	40	8.7	9.6	10.3	11.1	11.7	12.4	13.0	13.5	14.1	14.6	15.1	15.6	16.1	16.6	17.0	17.5
	50	8.5	9.3	10.1	10.8	11.4	12.0	12.6	13.2	13.7	14.2	14.7	15.2	15.7	16.1	16.6	17.0
	60	8.3	9.1	9.8	10.5	11.1	11.7	12.3	12.8	13.4	13.9	14.3	14.8	15.3	15.7	16.1	16.6
	70	8.1	8.8	9.6	10.2	10.8	11.4	12.0	12.5	13.0	13.5	14.0	14.4	14.9	15.3	15.7	16.1
	80	7.9	8.6	9.3	10.0	10.6	11.1	11.7	12.2	12.7	13.2	13.7	14.1	14.5	15.0	15.4	15.8
	90	7.7	8.4	9.1	9.7	10.3	10.9	11.4	11.9	12.4	12.9	13.3	13.8	14.2	14.6	15.0	15.4
	100	7.5	8.3	8.9	9.5	10.1	10.7	11.2	11.7	12.2	12.6	13.1	13.5	13.9	14.3	14.7	15.1
	110	7.4	8.1	8.7	9.3	9.9	10.4	10.9	11.4	11.9	12.3	12.8	13.2	13.6	14.0	14.4	14.8
	120	7.2	7.9	8.6	9.2	9.7	10.2	10.7	11.2	11.7	12.1	12.5	12.9	13.3	13.7	14.1	14.5

$$Q = a\sqrt{\frac{2gH}{1 + K_m + K_pL}}$$

Where:
- Q = Discharge (cubic feet second)
- a = Pipe area (square feet)
- g = Acceleration of gravity (feet/second^2)
- H = Elevation head differential (feet)
- K_m = Coefficient of minor losses
- K_p = Pipe friction coefficient
- L = Pipe length (feet)

$K_m = 1.0$

K_p = 0.3779 for 6-inch diameter, .02575 for 8-inch diameter, 0.191 for 10-inch diameter, .015 for 12-inch diameter