

Irrigation FACTSHEET



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PRESSURE RATINGS OF PVC PIPE FOR IRRIGATION

There are four major types of plastic pipe used in pipe manufacture. These include:

PVC.....Polyvinyl chloride
PE.....Polyethylene
ABS.....Acrylonitrile butadiene styrene
PB.....Polybutylene

Presently, only PVC and PE are used to any great extent in irrigation.

The pressure rating of a plastic pipe is the estimated maximum pressure the fluid in the pipe can exert continuously with a high degree of certainty that the pipe will not fail. It must withstand working pressure, highest static pressure and any reasonable pressure surges. There are two systems of classifying the pressure ratings of plastic pipe:

The "Schedule" System

The plastic pipe is grouped under headings of Schedule A, Schedule 40, Schedule 80 and Schedule 120. It is the familiar designation for pipe in which the outside diameter, wall thickness and inside diameter are fixed by specification. The dimensions of plastic pipe produced to these schedules are exactly the same as corresponding iron pipe. Working pressure varies for different pipe diameter within any schedule. Each pipe size, in each of these schedules, has a recommended working pressure rating. These pressures are based on the dimensions of the pipe and on the design stress of the material. The number after the word "Schedule" is **not** a pressure indication. **SAFE WORKING PRESSURES MUST BE OBTAINED FROM THE SUPPLIER OF THE PIPE.** Schedule rated pipe is used mainly for industrial purposes.

**TABLE OF PIPE SIZES USING THE "SCHEDULE" SYSTEM
SCHEDULE 40 PVC PIPE**

NOMINAL SIZE	O.D. (Inches)	I.D. (Inches)	WALL THICKNESS (Inches)	MAXIMUM WORKING PRESSURE (23° C) *
1/2"	0.840	0.622	0.109	590 psi
3/4"	1.050	0.824	0.113	480 psi
1"	1.315	1.049	0.133	450 psi
1-1/4"	1.660	1.380	0.140	365 psi
1-1/2"	1.900	1.610	0.145	330 psi
2"	2.375	2.069	0.154	275 psi
2-1/2"	2.875	2.469	0.203	300 psi
3"	3.500	3.068	0.216	260 psi
4"	4.500	4.026	0.237	220 psi
5"	5.563	5.047	0.258	190 psi
6"	6.625	6.065	0.280	175 psi
8"	8.625	7.981	0.322	160 psi
10"	10.750	10.020	0.365	140 psi

* Notice how with each pipe size, a different maximum working pressure applies.

The “CLASS”, “SERIES” or “SDR” System

In this system of classifying plastic pipe with respect to their pressure rating, the pipe is put into groups all having the same working pressure rating. It is a system in which the working pressure for all pipe in a given series is the same; they have the same safety margin and they operate at the same fibre stress. The pipe is grouped according to its “SDR” – Standard Dimensional Ratio. SDR is the relationship of pipe wall thickness and diameter in the equation, $SDR = \text{outside diameter}/\text{wall thickness}$.

Example:

6" PVC SDR 26 Series 160

Maximum working pressure = 160 psi
 Outside Diameter = 6.625 "
 Wall Thickness = 0.255 "
 $SDR = \frac{6.625}{0.255} = 26$

The wall thickness and inside diameter vary with the pressure rating or class of pipe. The number after “Class” or “Series” in this system is the maximum working pressure (at 23° C) to use when selecting plastic pipe for irrigation purposes.

**TABLE OF PIPE SIZES USING THE “CLASS”, “SERIES” OR “SDR” SYSTEM
 CLASS 160 (SERIES) PVC PIPE (SDR 26)**

NOMINAL SIZE	O.D. (Inches)	I.D. (Inches)	WALL THICKNESS (Inches)	MAXIMUM WORKING PRESSURE (23° C) *
1-1/2"	1.900	1.740	0.080	160
2"	2.375	2.193	0.091	160
2-1/2"	2.875	2.655	0.110	160
3"	3.500	3.230	0.135	160
4"	4.500	4.154	0.173	160
5"	5.563	5.135	0.214	160
6"	6.625	6.115	0.255	160
8"	8.625	7.961	0.332	160
10"	10.750	9.924	0.413	160
12"	12.750	11.770	0.490	160

* Notice maximum working pressure remains the same in the table as the pipe sizes change.

Important Points When Selecting Plastic Pipe

1. Maximum operating pressure plus surge allowance should not exceed the pressure (class) rating.
2. Maximum operating pressure should not exceed 72% of the pressure (class) rating for irrigation pipe.
3. Pressure ratings for threaded pipe are one-half of those for non-threaded pipe in the same material and size.

FOR FURTHER INFORMATION CONTACT:

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