

Pressure Testing Outside The Trench:

- If specified by the engineer, pressure testing may be conducted prior to pipe installation.
- After the pipe has been joined, fill it with water, carefully bleed off any trapped air. Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint; any leakage must be repaired and then retested.

NOTE: It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground.

Testing In The Trench:

- Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.
- The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
- When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured. Add and measure the amount of make-up water required to return to the test pressure and compare this to the maximum allowance in the table below.
- An alternate leakage test consists of maintaining the test pressure (described above) over a period of 4 hours and then dropping the pressure by 10 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.

NOTES:

- Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to “relax” for 8 hours prior to the next test sequence.
- Air testing is not recommended. Additional safety precautions may be required.
- Above procedure taken from PPI Technical Report TR-31 by the Plastic Pipe Institute.

ALLOWANCE FOR EXPANSION UNDER TEST PRESSURE							
NOMINAL PIPE SIZE ⁽¹⁾	U.S. GALS/100 FT. OF PIPE ⁽²⁾			NOMINAL PIPE SIZE ⁽¹⁾	U.S. GALS/100 FT. OF PIPE ⁽²⁾		
	1 HOUR	2 HOURS	3 HOURS		1 HOUR	2 HOURS	3 HOURS
2"	0.08	0.12	0.15	20"	2.80	5.50	8.00
3"	0.10	0.15	0.25	22"	3.50	7.00	10.50
4"	0.13	0.25	0.40	24"	4.50	8.90	13.30
5"	0.21	0.41	0.63	28"	5.50	11.10	16.80
6"	0.30	0.60	0.90	30"	6.20	12.60	19.10
8"	0.50	1.00	1.50	32"	7.00	14.30	21.50
10"	0.75	1.30	2.10	36"	9.00	18.00	27.00
12"	1.10	2.30	3.40	42"	12.00	24.00	36.00
14"	1.40	2.80	4.20	48"	15.00	27.00	43.00
16"	1.70	3.30	5.00	54"	18.00	30.00	50.00
18"	2.20	4.30	6.50	—	—	—	—

⁽¹⁾mm=0.03937, ⁽²⁾multiply by 11.53 to convert to liters/100 meters of pipe.