



# Arkansas Department of Health

## Engineering Section

### POLICY ON PLASTIC PIPE FOR PUBLIC SEWER SYSTEMS

Revised October 1, 2008

Note: This revision of the previous policy dated September 10, 1973, is intended to bring this policy up-to-date in relation to the latest relevant ASTM standards. This policy revision is not intended to significantly modify the previous policy.

This policy designates general requirements for polyvinylchloride (PVC) plastic sewer pipe for use in gravity sewer systems which handle normal sanitary wastes. Certain commercial and industrial wastes consist of exotic chemicals, solvents, and compounds which can materially deteriorate plastic pipes. This policy should not be interpreted as an endorsement of plastic sewer pipe and shall not be used for advertising purposes.


In rigid sewer pipes the inherent strength of the pipe is the predominant source of its supporting ability; however, in plastic pipes, the supporting ability is derived from soil used in the embedment and backfill. Therefore, the use of plastic sewer pipe will be considered only when proper design of the pipe and its embedment has been presented.

This office will accept the use of PVC plastic pipe which conforms to the following:

1. Plans and specifications for the pipe installation and material shall be prepared by a registered engineer and shall be approved by the office. Engineering supervision of the construction must be provided by the engineer.
2. All PVC sewer pipe and fittings shall conform to the requirements of the latest revision of ASTM D3034 and shall be made of plastic having a cell classification of 12454 as defined in ASTM D1784. The pipe shall exhibit a pipe stiffness of at least 46 PSI at 5% deflection as defined by ASTM D4212.
3. Provision shall be made for expansion and contraction at each joint by use of a gasket type joint and integral bell.
4. The length of the pipe sections shall not exceed twenty feet. All pipe sections shall be straight and true in alignment.
5. All pipe and fittings shall be tested in accordance with ASTM D2412, D2512, and D2444.
6. A written agreement shall be made between the purchaser and the seller making certification the basis of acceptance of the material. This shall consist of a copy of the manufacturer's test report or statement by the seller, accompanied by a copy of the test results, that the material has been sampled, tested, and inspected. Each certification shall be signed by an authorized agent of the seller or manufacturer.
7. All plastic sewer pipe shall be installed in accordance with ASTM D2321. Bedding and haunching materials shall be Class I or Class II as described in the standards. Class III and Class IV will not be suitable for embedment. For installations near or below the ground water table, Class I materials shall be used for bedding, haunching, and initial backfill. This embedment shall extend from 6 inches below the pipe to 6 inches above the pipe.

8. After the pipe has been laid and backfilled, the line shall be tested for tightness by air testing, infiltration, or exfiltration tests. The maximum allowable amount of leakage shall be 100 gallons per day per inch-mile. The minimum time requirements for air testing for a 0.5 psig pressure drop from 3.5 psig to 3.0 psig shall not be less than the times specified in Table 2 of ASTM F1417 (see below). Procedures for air testing must be in accordance with established references such as ASTM F1417 and UniBell publication UNI-B-6-98.
9. After the pipe has been laid and backfilled, the engineer shall require a deflection test. This test shall consist of pulling a mandrel through the pipe. The maximum deflection allowable shall not exceed 5% of the pipe's internal diameter.
10. The warranties set forth in the engineer's specifications shall govern replacement and include both workmanship and material, and shall be for a period of not less than one year from the date of acceptance by the owner.
11. Plastic Sewer Pipe Other Than Solid Wall PVC: Plastic sewer pipe other than solid wall PVC pipe will be reviewed on a case by case basis. The specifications will be reviewed to ensure that appropriate ASTM references, stiffness, cell classification, bedding, and appropriate testing and inspection is indicated in the plans and specifications.

This policy is not proposed to be used for engineering specifications; and therefore, should not be used as a reference in the engineer's plans and specifications.

 **F 1417 – 92 (2005)**

**TABLE 1 Minimum Specified Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated for  $Q = 0.0015$**

NOTE 1—See Practice UNI-B-6-90.

NOTE 2—Consult with pipe and appurtenance manufacturer for maximum test pressure for pipe size greater than 30 in. in diameter.

Pipe Diameter, in.	Minimum Time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for Length (L) Shown, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.308 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

**TABLE 2 Minimum Specified Time Required for a 0.5 psig Pressure Drop for Size and Length of Pipe Indicated for  $Q = 0.0015$**

NOTE 1—Consult with pipe and appurtenance manufacturer for maximum test pressure for pipe size greater than 30 in. in diameter.

Pipe Diameter, in.	Minimum Time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for Length (L) Shown, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23