WL130 PE4710 FM Approved Pipe

IPS & DIPS Pipe Sizes – Class 150, 200 & 267

WL Plastics PE4710 FM Approved Pipe is listed by FM Approvals for underground fire protection service in accordance with FM Approval Standard Class Number 1613, *Polyethylene (PE) Pipe and Fittings for Underground Fire Protection.* ***WL Plastics PE4710 FM Approved Pipe*** is manufactured from NSF-61 certified HDPE compound that meets or exceeds material designations PE3408 and PE3608. WL Plastics PE4710 compound per WL106 meets or exceeds ASTM D3350 Cell Classification PE445574C and PE345464C.

- ***WL Plastics PE4710 FM Approved Pipe*** complies with AWWA C906-15 and NFPA 24[(1)]
- ***WL Plastics PE4710 FM Approved Pipe*** is NSF-61 certified for potable water service.
- Coextruded Red or Blue stripes are available upon request. (WL105)
- Manufactured at FM Approvals Certified WL Plastics plants: Cedar City, UT USA, Crossfield, AB Canada – IPS/DIPS 36 and smaller sizes; Bowie, TX USA, Elizabethtown, KY USA – IPS 24 and smaller sizes.

Table 1 – WL Plastics PE4710 FM Approved IPS Pipe – Class 150, 200 and 267[(2)]

IPS size	Average OD, in (mm)	Class 150	Class 200	Class 267[(2)]
		Average ID, in (mm)[(3)]	Average ID, in (mm)[(3)]	Average ID, in (mm)[(3)]
2	2.375 (60.3)	1.941 (49.3)	1.816 (46.1)	(not available)
3	3.500 (88.9)	2.860 (72.6)	2.676 (68.0)	(not available)
4	4.500 (114.3)	3.678 (93.4)	3.440 (87.4)	3.137 (79.7)
6	6.625 (168.3)	5.414 (137.5)	5.064 (128.6)	4.619 (117.3)
8	8.625 (219.1)	7.049 (179.0)	6.593 (167.5)	6.013 (152.7)
10	10.750 (273.0)	8.785 (223.1)	8.218 (208.7)	7.494 (190.3)
12	12.750 (323.9)	10.420 (264.7)	9.747 (247.6)	8.889 (225.8)
14	14.000 (355.6)	11.441 (290.6)	10.702 (271.8)	9.760 (247.9)
16	16.000 (406.4)	13.076 (332.1)	12.231 (310.7)	11.154 (283.3)
18	18.000 (457.2)	14.710 (373.6)	13.760 (349.5)	12.549 (318.7)
20	20.000 (508.0)	16.345 (415.2)	15.289 (388.6)	13.943 (354.2)
22	22.000 (558.8)	17.979 (456.7)	16.818 (427.2)	15.337 (389.6)
24	24.000 (609.6)	19.614 (498.2)	18.347 (466.1)	16.731 (425.0)
26	26.000 (660.4)[(4)]	21.248 (539.7)	19.876 (504.8)	(not available)
28	28.000 (711.2)[(4)]	22.883 (581.2)	21.404 (543.7)	(not available)
30	30.000 (762.0)[(4)]	24.517 (622.7)	22.933 (582.5)	(not available)
32	32.000 (812.8)[(4)]	26.152 (664.3)	24.462 (621.3)	(not available)
34	34.000 (863.6)[(4)]	27.786 (705.8)	25.991 (660.2)	(not available)
36	36.000 (914.4)[(4)]	29.421 (747.3)	27.520 (699.0)	(not available)

Contact WL Plastics Customer Service to confirm availability. ***(1)*** **WL Plastics FM Approved Pipe is available exclusively in the sizes and pressure classes shown. WL Plastics PE4710 FM Approved pipe complies with FM1613, AWWA C906-15 and NFPA 24.** NOT AVAILABLE: manufacture per ASTM F714, D3035; custom diameters; custom DR's; DR's and pressure classes not shown. ***(2)*** Crossfield, AB only. ***(3)*** Average ID is for flow estimation only. Actual ID will vary depending on actual dimensions and tolerances. DO NOT use average ID for sizing devices such as stiffeners that install in the pipe bore. All dimensions in inches; metric conversions for inch dimensions rounded to the nearest 0.1 mm. ***(4)*** Cedar City, UT USA and Crossfield, AB Canada only. ***(5)*** See page 2 for additional information on pressure capabilities. ***(6)*** Maximum internal pressure during momentary surge event.

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Table 2 – WL Plastics PE4710 FM Approved DIPS Pipe – Class 150, 200

DIPS size	Average OD, in (mm)	Class 150	Class 200
		Average ID, in (mm)[2]	Average ID, in (mm)[2]
4	4.800 (121.9)	3.923 (99.6)	3.669 (93.2)
6	6.900 (175.3)	5.639 (143.2)	5.275 (134.0)
8	9.050 (229.9)	7.396 (187.9)	6.919 (175.7)
10	11.100 (281.9)	9.071 (230.4)	8.485 (215.5)
12	13.200 (335.3)	10.788 (274.0)	10.091 (256.3)
14	15.300 (388.6)	12.504 (317.6)	11.696 (297.1)
16	17.400 (441.9)	14.220 (361.2)	13.301 (337.9)
18	19.500 (495.3)	15.936 (404.8)	14.907 (378.6)
20	21.600 (548.6)	17.652 (448.4)	16.512 (419.4)
24	25.800 (655.3)	21.085 (535.6)	19.723 (501.0)
30	32.000 (812.8) [3]	26.152 (664.3)	24.462 (621.3)
36	38.300 (972.8) [3]	31.300 (795.0)	29.278 (743.6)

Table 3 – Pressure Capabilities for Water at 108°F/42°C and Lower, psi (kPa) [4]

Class	Operating Pressure	Surge Pressure Allowance		Maximum Pressure[5] – Operating plus Surge	
		Occasional	Recurring	Occasional	Recurring
150	150 (1034)	150 (1034)	75 (517)	300 (2069)	225 (1552)
200	200 (1379)	200 (1379)	100 (690)	400 (2759)	300 (2069)
267	267 (1841)	267 (1841)	133 (920)	534 (3683)	400 (2759)

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WL Plastics PE4710 FM Approved Pipe for Underground Fire Mains

WL Plastics PE4710 FM Approved Pipe is produced in Class 150 (150 psi; 1034 kPa), Class 200 (200 psi; 1379 kPa) and Class 267 (267 psi; 1841 kPa). Class ratings are applicable to sustained internal water pressure (working pressure) up to 108ºF/42ºC. Working Pressure is reduced for sustained water service temperatures above 108ºF/42ºC.

Table 4 – Working Pressure, psi (kPa)

Sustained Operating Temperature		*Class 150*	*Class 200*	*Class 267*
ºF	*ºC*			
≤108	≤42	150 (1034)	200 (1379)	267 (1841)
110	43	146 (1007)	195 (1345)	260 (1793)
115	46	142 (979)	190 (1310)	253 (1745)
120	49	136 (938)	183 (1262)	243 (1676)
125	52	133 (917)	178 (1228)	237 (1634)
130	54	127 (876)	170 (1172)	227 (1566)
135	57	121 (834)	163 (1124)	217 (1497)
140	60	118 (814)	158 (1090)	210 (1448)

WL Plastics PE4710 FM Approved Pipe for underground fire main service safely withstands repetitive and occasional surge pressures that increase internal pressure above the Class rating without short-term or long-term damage.

- Allowances for repetitive and occasional surge pressures are applied ***above*** the Class rating.
- The maximum allowable internal pressure during a surge event is the sum of the Class rating and the surge pressure allowance.

Surge pressure allowances are added to the Class rating to accommodate momentary surge pressure events.

- Surge pressure allowance is never applied to increase Class rating for sustained operating pressure (working pressure).

If the potential surge pressure is greater than the surge pressure allowance, operating pressure (working pressure) is reduced and the difference is applied to surge pressure allowance; or pipe having a higher Class rating is used to provide higher surge pressure allowance.

- **Allowance for recurring surge pressure (P_{RS})**. Recurring surge pressures occur frequently and are inherent to the normal design and operation of the system. Recurring surge pressures may be caused by normal pump start-up or shutdown and normal control valve opening or closure. The recurring surge pressure allowance is:

$$P_{RS} = 0.5 \, x \, Class_{ET}$$

- **Allowance for occasional surge pressure (P_{OS})**. Occasional surge pressures are generated during infrequently occurring conditions such as emergency operation or system malfunction. Occasional surge pressures can occur during firefighting or a malfunction, such as a power failure or system component failure, including pump seize-up, valve-stem failure, or pressure-relief-valve failure. The occasional surge pressure allowance is:

$$P_{OS} = 1.0 \, x \, Class_{ET}$$

Table 5 – Allowable Water Flow Velocity for *WL Plastics PE4710 FM Approved Pipe* (≤108°F/42°C)

Class	*Allowable Sudden Velocity Change[1]*		*Surge pressure, psi, for 1 ft/s velocity change*	*Surge pressure, kPa, for 1 m/s velocity change*
	Recurring Surge Event ft/s (m/s)	*Occasional Surge Event, ft/s (m/s)*		
150	5.4 (1.7)	10.8 (3.3)	13.8	312
200	6.2 (1.9)	12.4 (3.8)	16.2	366
267	6.9 (1.9)	14.1 (4.3)	18.9	428

(1) This is the allowable flow velocity where the operating pressure in the pipe (working pressure) is equal to the Class rating pressure. Higher flow velocity is allowable when operating pressure (working pressure) is less than the Class rating. Allowable velocity is increased by adding the pressure difference between operating pressure and class rating to the pressure surge allowance.

For example, the allowable flow velocity in Class 150 pipe operating at 110 psi is

$$5.4 + \frac{(150 - 110)}{13.8} = 8.3 \, ft/s$$

for recurring surge pressure conditions; or

$$10.8 + \frac{(150 - 110)}{13.8} = 13.7 \, ft/s$$

for occasional surge pressure conditions.

SALES: wlsales@wlplastics.com ● TECHNICAL: wltechnical@wlplastics.com