

WL130 – WL Plastics FM Approved Pipe

IPS Pipe Sizes – Class 150 & 200



WL Plastics FM Approved Pipe is listed by Factory Mutual Approvals for underground fire protection service in accordance with Factory Mutual Approval Standard Class Number 1613, *Polyethylene (PE) Pipe and Fittings for Underground Fire Protection*, and is manufactured from NSF-61 certified HDPE compound that meets or exceeds material designations PE3408, PE3608 and ASTM D 3350 Cell Classification 345464C. **WL Plastics FM Approved Pipe** complies with AWWA C906-99 and NFPA 24.

- WL Plastics FM Approved Pipe is NSF-61 certified for potable water service.
- Coextruded Red or Blue stripes available as an option.
- Manufactured at FM Approvals Certified WL Plastics plants at Cedar City, UT USA – 36” IPS and smaller sizes, Bowie, TX USA – 24” IPS and smaller sizes, and Crossfield, AB Canada – 24” IPS and smaller sizes.

WL Plastics FM Approved IPS Pipe – Class 150 and Class 200⁽¹⁾

IPS size	Average OD, in (mm)	Class 150		Class 200	
		Average ID, in (mm) ⁽²⁾		Average ID, in (mm) ⁽²⁾	
4	4.500 (114.3)	3.678 (93.4)		3.440 (87.4)	
6	6.625 (168.3)	5.414 (137.5)		5.064 (128.6)	
8	8.625 (219.1)	7.049 (179.0)		6.593 (167.5)	
10	10.750 (273.0)	8.785 (223.1)		8.218 (208.7)	
12	12.750 (323.9)	10.420 (264.7)		9.747 (247.6)	
14	14.000 (355.6)	11.441 (290.6)		10.702 (271.8)	
16	16.000 (406.4)	13.076 (332.1)		12.231 (310.7)	
18	18.000 (457.2)	14.710 (373.6)		13.760 (349.5)	
20	20.000 (508.0)	16.345 (415.2)		15.289 (388.6)	
22	22.000 (558.8)	17.979 (456.7)		16.818 (427.2)	
24	24.000 (609.6)	19.614 (498.2)		18.347 (466.1)	
26	26.000 (660.4)	21.289 (540.7)		19.876 (504.8)	
28	28.000 (711.2)	22.926 (582.3)		21.404 (543.7)	
30	30.000 (762.0)	24.564 (623.9)		22.933 (582.5)	
32	32.000 (812.8)	26.202 (655.5)		(not available)	
34	34.000 (863.6)	27.839 (707.1)		(not available)	
36	36.000 (914.4)	29.477 (748.7)		(not available)	

Pressure Capabilities for Water at 80°F and Lower, psi (kPa)⁽³⁾

Class	Operating Pressure	Surge Pressure Allowance		Maximum Pressure ⁽⁴⁾ – Operating plus Surge	
		Occasional	Recurring	Occasional	Recurring
150	150 (1035)	150 (1035)	75 (517)	300 (2069)	225 (1552)
200	200 (1380)	200 (1380)	100 (690)	400 (2759)	300 (2069)

Contact WL Plastics Customer Service to confirm availability. (1) WL Plastics FM Approved Pipe is available exclusively in the sizes and pressure classes shown. Complies with FM1613, AWWA C906-99 and NFPA 24. Custom manufacture to ASTM F714, custom diameters, DR's, and pressure classes are not available. (2) 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. (3) See page 2 for additional information on pressure capabilities. (4) Maximum pressure during momentary surge event.



ISO 9001:2008 Certified



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WL Plastics FM Approved Pipe for Underground Fire Mains

WL Plastics FM Approved Pipe is produced in Class 150 (150 psi; 1034 kPa) and Class 200 (200 psi; 1379 kPa). Class ratings are for continuous internal water pressure at 80°F (27°C) and lower service temperatures. Class ratings are reduced for continuous service temperatures above 80°F (27°C).

$$Class_{ET} = Class \times F_T$$

Where

$Class_{ET}$ = Class rating for water at elevated temperature, psi

$Class$ = Class rating for water ≤80°F (27°C), psi

F_T = temperature compensation multiplier

Table 1 – Temperature Compensation Multipliers, F_T ,

Maximum Operating Temperature		Multiplier, F_T
°F	°C	
up to 80	up to 27	1.00
from 81 to 90	from 28 to 32	0.90
from 91 to 100	from 33 to 38	0.82
from 101 to 110	from 39 to 43	0.75
from 111 to 120	from 44 to 49	0.68
from 121 to 130	from 50 to 54	0.61
from 131 to 140	from 55 to 60	0.54

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

- Allowances for momentary surge pressures are applied above the Class rating.
- The maximum pressure during a momentary surge event is the sum of the Class rating and the surge pressure allowance.

Surge pressure allowances are added to the Class rating and used only during a momentary surge pressure event. Surge pressure allowance is never used to supplement Class rating for steady 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 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 valve opening or closure. The recurring surge pressure allowance is:

$$P_{RS} = 0.5 \times Class_{ET}$$

- **Allowance for occasional surge pressure (P_{OS}).** Occasional surge pressures are generated during irregularly occurring conditions such as emergency operation or system malfunction. Occasional surge pressures are often the result of 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:

$$P_{OS} = 1.0 \times Class_{ET}$$

Table 2 – Allowable Water Flow Velocity for WL Plastics FM Approved Pipe (Water at ≤80°F (≤27°C))

Class	Allowable Sudden Velocity Change ⁽¹⁾		Surge pressure, psi, for 1 fps velocity change	Surge pressure, kPa, for 1 mps velocity change
	Recurring Surge Event fps (mps)	Occasional Surge Event, fps (mps)		
150	5.4 (1.7)	10.8 (3.3)	13.8	312
200	6.2 (1.9)	12.4 (3.8)	16.2	366

(1) This is the maximum flow velocity where the operating pressure in the pipe (working pressure) is equal to the Class rating pressure. Higher flow velocity is allowable where the operating pressure (working pressure) is less than the Class rating because the pressure difference between operating pressure and class rating may be applied to pressure surge allowance, thus increasing allowable velocity.

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

$$5.4 + \frac{(150 - 110)}{13.8} = 8.3 \text{ fps}$$

for recurring surge pressure conditions; or

$$10.8 + \frac{(150 - 110)}{13.8} = 13.7 \text{ fps}$$

for occasional surge pressure conditions.

This publication is intended for use as a piping system guide, but not in place of a professional engineer's judgment or advice, and not as installation instructions. The information in this publication does not constitute a guarantee or warranty for piping installations, and cannot be guaranteed because the conditions of use are beyond our control. WL Plastics Corporation has made every reasonable effort to ensure accuracy, but the information in this publication may not be complete, especially for special or unusual applications. Changes to this publication may occur from time to time without notice. Contact WL Plastics Corp to determine if you have the most current edition.