



WL Plastics Ltd.
3575 Lone Star Circle
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Fort Worth, TX, USA
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May 1, 2017

To: FM Approved pipe users
RE: FM 1613 February 2017 revision Pressure Class changes

Dear Customers,

Effective February 2017, FM Approvals has updated the Pressure Classes in standard FM 1613 to match those found in AWWA C906-15. Please see <http://www.fmaprovals.com/standards-development/new-and-updated-standards> for a copy of the current version.

In response to the newly published FM Approvals Class Number 1613 February 2017 revision, WL Plastics has upgraded our official listings with FM Approvals to reflect the new pressure classes. WL Plastics will no longer offer previous classes except in special circumstances when specifically requested by the customer. Technical support and documentation for the transition will be provided.

Moving forward, the following pressure classes apply for WL Plastics <FM> marked pipe:

- **PC 200 = DR 11** : (Previous class 150)
- **PC 250 = DR 9** : (Previous class 200)
- **PC 335 = DR 7** : (Previous class 250)

WL Plastics will offer a triple stamp print line that meets the requirements of ASTM F714, AWWA C906, and FM1613.

Example Triple Stamp Print Line:

IPS 12" DR9 WL Plastics TX - PE4710-PE445574C PC250 AWWA C-906-ASTM F714- FM1613 A1-01-01-16 NSF-61 50FT

If you have any further questions, please do not hesitate to contact us.

A handwritten signature in black ink that reads 'Barb Donaldson'. The signature is written in a cursive, flowing style.

Barb Donaldson
Corporate Quality Director
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www.wlplastics.com
The Ideal Piping Solution

WL130 PE4710 FM Approved Pipe

IPS & DIPS Pipe Sizes – Class 200, 250 & 335



WL Plastics PE4710 FM Approved Pipe is listed by FM Approvals for underground fire protection service in accordance with FM Approval Standard Class Number 1613-17, *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 – IPS/DIPS 36 and smaller sizes; Bowie, TX USA, Elizabethtown, KY USA, Rapid City, SD USA – IPS 24 and smaller sizes.

Table 1 – WL Plastics PE4710 FM Approved IPS Pipe – Class 200, 250 and 335

| IPS size | Average OD, in (mm) | Class 200 | Class 250 | Class 335 |
|----------|-------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | | Average ID, in (mm) ⁽²⁾ | Average ID, in (mm) ⁽²⁾ | Average ID, in (mm) ⁽²⁾ |
| 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) ⁽³⁾ | 21.248 (539.7) | 19.876 (504.8) | (not available) |
| 28 | 28.000 (711.2) ⁽³⁾ | 22.883 (581.2) | 21.404 (543.7) | (not available) |
| 30 | 30.000 (762.0) ⁽³⁾ | 24.517 (622.7) | 22.933 (582.5) | (not available) |
| 32 | 32.000 (812.8) ⁽³⁾ | 26.152 (664.3) | 24.462 (621.3) | (not available) |
| 34 | 34.000 (863.6) ⁽³⁾ | 27.786 (705.8) | 25.991 (660.2) | (not available) |
| 36 | 36.000 (914.4) ⁽³⁾ | 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 FM1613-17, AWWA C906-15 and NFPA 24. THE FOLLOWING IS NOT AVAILABLE: manufacture per ASTM F714, D3035; custom diameters; custom DR's; DR's and pressure classes not shown. (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 ID. All dimensions in inches; metric conversions for inch dimensions rounded to the nearest 0.1 mm. (3) Cedar City, UT USA only.

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.

WL130 PE4710 FM Approved Pipe

IPS & DIPS Pipe Sizes – Class 200, 250 & 335



Table 2 – WL Plastics PE4710 FM Approved DIPS Pipe – Class 200, 250 & 335

| DIPS size | Average OD, in (mm) | Class 200 | Class 250 | Class 335 |
|-----------|-------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | | Average ID, in (mm) ⁽²⁾ | Average ID, in (mm) ⁽²⁾ | Average ID, in (mm) ⁽²⁾ |
| 4 | 4.800 (121.9) | 3.875 (98.4) | 3.669 (93.2) | 3.346 (85.0) |
| 6 | 6.900 (175.3) | 5.570 (141.5) | 5.275 (134.0) | 4.810 (122.2) |
| 8 | 9.050 (229.9) | 7.306 (185.6) | 6.918 (175.7) | 6.309 (160.3) |
| 10 | 11.100 (281.9) | 8.961 (227.6) | 8.485 (215.5) | 7.738 (196.6) |
| 12 | 13.200 (335.3) | 10.656 (270.7) | 10.091 (256.3) | 9.202 (233.7) |
| 14 | 15.300 (388.6) | 12.351 (313.7) | 11.696 (297.1) | 10.666 (270.9) |
| 16 | 17.400 (441.9) | 14.047 (356.8) | 13.301 (337.9) | 12.130 (308.1) |
| 18 | 19.500 (495.3) | 15.742 (399.9) | 14.907 (378.6) | 13.594 (345.3) |
| 20 | 21.600 (548.6) | 17.437 (442.9) | 16.512 (419.4) | 15.058 (382.5) |
| 24 | 25.800 (655.3) | 20.828 (529.0) | 19.723 (501.0) | 17.986 (456.8) |
| 30 | 32.000 (812.8) ⁽³⁾ | 25.833 (656.2) | 24.462 (621.3) | (not available) |
| 36 | 38.300 (972.8) ⁽³⁾ | 30.919 (785.3) | (not available) | (not available) |

Table 3 – Pressure Capabilities for Water at 73°F/23°C and Lower, psi (kPa)⁽⁴⁾

| Class | Operating Pressure | Surge Pressure Allowance | | Maximum Pressure ⁽⁵⁾ – Operating plus Surge | |
|-------|--------------------|--------------------------|------------|--|------------|
| | | Occasional | Recurring | Occasional | Recurring |
| 200 | 200 (1379) | 200 (1379) | 100 (690) | 400 (2758) | 300 (2068) |
| 250 | 250 (1724) | 250 (1724) | 125 (862) | 500 (3447) | 375 (2586) |
| 335 | 335 (2310) | 335 (2310) | 168 (1158) | 670 (4620) | 503 (3468) |

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WL130 PE4710 FM Approved Pipe

IPS & DIPS Pipe Sizes – Class 200, 250 & 335



WL Plastics PE4710 FM Approved Pipe for Underground Fire Mains

WL Plastics PE4710 FM Approved Pipe is produced in Class 200 (200 psi; 1379 kPa), Class 250 (250 psi; 1724 kPa) and Class 335 (335 psi; 2310 kPa). Class ratings are applicable to sustained internal water pressure (working pressure) up to 73°F/23°C. Working Pressure is reduced for sustained water service temperatures above 73°F/23°C.

Table 4 – Working Pressure, psi (kPa)

| Sustained Operating Temperature | | Class 200 | Class 250 | Class 335 |
|---------------------------------|-----|------------|------------|------------|
| °F | °C | | | |
| ≤73 | ≤23 | 200 (1379) | 250 (1724) | 335 (2310) |
| 80 | 27 | 192 (1324) | 240 (1655) | 320 (2206) |
| 90 | 32 | 180 (1241) | 225 (1551) | 300 (2068) |
| 100 | 38 | 168 (1158) | 210 (1448) | 280 (1931) |
| 110 | 43 | 156 (1076) | 195 (1345) | 260 (1793) |
| 120 | 49 | 146 (1007) | 183 (1262) | 243 (1675) |
| 130 | 54 | 136 (938) | 170 (1172) | 227 (1565) |
| 140 | 60 | 126 (869) | 158 (1090) | 210 (1448) |

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

- 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 Pressure 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:

$$P_{RS} = 0.5 \times \text{Class}_{ET}$$

- **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:

$$P_{OS} = 1.0 \times \text{Class}_{ET}$$

Table 5 – Allowable Water Flow Velocity for WL Plastics PE4710 FM Approved Pipe (≤73°F/23°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) | | |
| 200 | 7.0 (2.1) | 14.0 (4.3) | 14.4 | 326 |
| 250 | 7.7 (2.4) | 15.4 (4.7) | 16.2 | 366 |
| 335 | 8.9 (2.7) | 17.7 (5.4) | 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 200 pipe operating at 150 psi is

$$7.0 + \frac{(200 - 150)}{13.8} = 10.6 \text{ ft/s}$$

for recurring surge pressure conditions; or

$$14.0 + \frac{(200 - 150)}{13.8} = 17.6 \text{ ft/s}$$

for occasional surge pressure conditions.

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