



**APPENDIX C  
CODE CHANGE PROPOSAL  
NORTH CAROLINA  
BUILDING CODE COUNCIL**

325 North Salisbury Street, Room 5\_44  
Raleigh, North Carolina 27603  
(919) 647-0009  
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\_\_\_\_\_ Petition for Rule Making Item Number \_\_\_\_\_  
 Granted by BCC \_\_\_\_\_ Adopted by BCC \_\_\_\_\_ Approved by RRC \_\_\_\_\_  
 Denied by BCC \_\_\_\_\_ Disapproved by BCC \_\_\_\_\_ Objection by RRC \_\_\_\_\_

PROPONENT: Brian Williams, P.E. PHONE: (757) 232-1490  
 REPRESENTING: Ferguson Enterprises  
 ADDRESS: 12500 Jefferson Avenue  
 CITY: Newport, News STATE: VA ZIP: 23602  
 E-MAIL: Brian.William1@ferguson.com FAX: ( ) -

North Carolina State Building Code, Volume 2018 Fuel Gas Code - Section Chapter 4

**CHECK ONE:**  Revise section to read as follows:  Delete section and substitute the following:  
 Add new section to read as follows:  Delete section without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED~~      UNDERLINE MATERIAL TO BE ADDED

Please type. Continue proposal or reason on plain paper attached to this form. See reverse side for instructions.

**Proposals attached to this form.**

Will this proposal change the cost of construction?    Decrease     Increase     No   
 Will this proposal increase to the cost of a dwelling by \$80 or more?    Yes     No   
 Will this proposal affect the Local or State funds?    Local     State     No   
 Will this proposal cause a substantial economic impact (≥\$1,000,000)?    Yes     No

- Non-Substantial – Provide an economic analysis including benefit/cost estimates.
- Substantial – The economic analysis must also include 2-alternatives, time value of money and risk analysis.
- Pursuant to §143-138(a1)(2) a cost-benefit analysis is required for all proposed amendments to the NC Energy Conservation Code. The Building Code Council shall also require same for the NC Residential Code, Chapter 11.

**REASON:** The attached paper contains change proposals for several sections of Chapter 4 of the Fuel Gas Code. The purpose is for inclusion of PEX-AL-PEX gas piping systems in applications where CSST has been approved. These systems have been used for gas distribution for over 15 years under numerous ISO, EU, and Australian standards. ASTM F1281 was first published in the year 2000 and includes allowance for use with gases that are compatible with the pipe and fittings.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ BCC CODE CHANGES  
 FORM 11/26/19

**Revise Section as Follows:**

**403.6 Plastic pipe, tubing and fittings.** Polyethylene plastic pipe, tubing and fittings used to supply fuel gas shall conform to ASTM D2513. Such pipe shall be marked "Gas" and "ASTM D2513".

Crosslinked PEX-Aluminum-PEX (PEX-AL-PEX) composite pipe, tubing and fittings used to supply and or distribute fuel gas shall conform to ASTM F1281. Such pipe shall be marked "Gas" and "ASTM F1281".

Polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) plastic pipe, tubing and fittings shall not be used to supply fuel gas.

**Reason:** The purpose is for inclusion of PEX-AL-PEX gas piping systems in applications where CSST has been approved. These systems have been used for gas distribution for over 15 years under numerous ISO, EU, and Australian standards. ASTM F1281 was first published in the year 2000 and includes allowance for use with gases that are compatible with the pipe and fittings.

**Revise Section as Follows:**

**404.3 PEX-AL-PEX** PEX-AL-PEX piping systems shall be installed in the accordance with the terms of their approval, the conditions of listing, the manufacturer's instructions and this code.

**Reason:** This proposal ensures that PEX-AL-PEX piping systems have the same code requirements as CSST piping Systems in Section 404.2.

**Revise Section as Follows:**

**404.5 Fittings in concealed locations.** Fittings installed in concealed locations shall be limited to the following types:

1. Threaded elbows, tees, and couplings.
2. Brazed fittings.
3. Welded fittings.
4. Fittings listed to ANSI LC-1/CSA 6.26 or ANSI LC-4.
5. Fittings listed to be used with PEX-AL-PEX piping systems.

**Reason:** This proposal ensures fittings being used with PEX-AL-PEX gas piping systems have been tested and listed to be used with the piping systems.

**Revise Section as Follows:**

**404.17.1 Limitations.** Plastic pipe shall be installed outdoors underground only. Plastic pipe shall not be used within or under any building or slab or be operated at pressures greater than 100 psig (689 kPa) for natural gas or 30 psig (207 kPa) for LP-gas.

**Exceptions:**

1. PEX-AL-PEX composite piping systems when installed in accordance with section 403.6.

**Reason:** The purpose is for inclusion of PEX-AL-PEX gas piping systems in applications where CSST has been approved. With the addition of PEX-AL-PEX in section 403.6, we can allow for this exception. Over the years, composite layered piping materials have been engineered for applications other than below ground distribution. PEX-AL-PEX systems have been used for gas service for over 15 years under numerous ISO, EU, and Australian standards. ASTM F1281 was first published in the year 2000 and includes allowance for use with gases that are compatible with the pipe and fittings.

**Revise Section as Follows:**

**405.3 Plastic Pipe.** Plastic pipe bends shall comply with the following:

3. The radius of the inner curve of such bends shall be ~~not less than 25 times the inside diameter of the pipe~~ in accordance with the manufacturer's instructions.

**Reason:** The maximum bend radius is determined by the flexibility, wall thickness, and size of the pipe. This bend

radius is specified by the manufacturer and it is not needed to have an installer measure the actual inner diameter to calculate the bend radius required.

**Revise Section as Follows:**

**407.2 Design and installation.** Piping shall be supported with ~~metal~~ pipe hooks, ~~metal~~ pipe straps, ~~metal~~ bands, ~~metal~~ brackets, ~~metal~~ hangers or building structural components, suitable for the size of piping, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. Piping shall be anchored to prevent undue strains on connected appliances and shall not be supported by other piping. Pipe hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section 415. Supports, hangers and anchors shall be installed so as to not interfere with the free expansion and contraction of piping between the anchors. The components of the supporting equipment shall be designed and installed so that they will not be disengaged by movement of the supported piping.

**Reason:** Metal can be abrasive to all piping materials and may cause damage over time with the free expansion and contraction of piping. There are plenty of brackets, hangers, supports, etc. made of other materials on the market that are suitable for the piping material they support.

**Revise Section as Follows:**

**415.1 Interval of support.** Piping shall be supported and intervals not exceeding the spacing specified in Table 415.1. Spacing of supports for CSST and PEX-AL-PEX shall be in accordance with the ~~CSST~~ manufacturer's instructions.

**Reason:** Like CSST, PEX-AL-PEX is lighter, more flexible, and has specific requirements to allow for normal expansion and contraction. Therefore, the manufacturer should specify the spacing requirements based on their pipe design.

**Add to Chapter 8 - Reference Standards:**

ASTM F1281-17 Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe

# **Jones Stephens PEXALGAS Gas Piping System**

## **Overview for North Carolina Builders Code Council Meeting**

**March 9, 2021**

# Jones Stephens PEXALGAS Gas Piping System

## Product Overview

- Standard Product in Europe, Australia and South America
- Exclusively offered in the USA by Jones Stephens (subsidiary of Ferguson Enterprises)
- ICC ES Report certifies compliance with IFCG, IRC, UPC and ASTM F1281
- Manufacturer audited annually by ICC
- Significant labor savings for our customers compared with CSST, Copper, Steel pipe
- To be available for sale in Ferguson branches and from Jones Stephens reps

## Safety Advantages

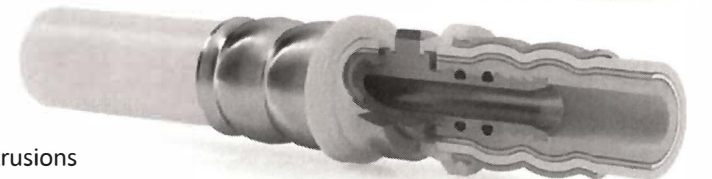
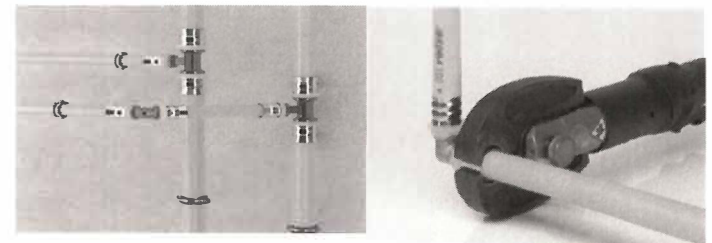
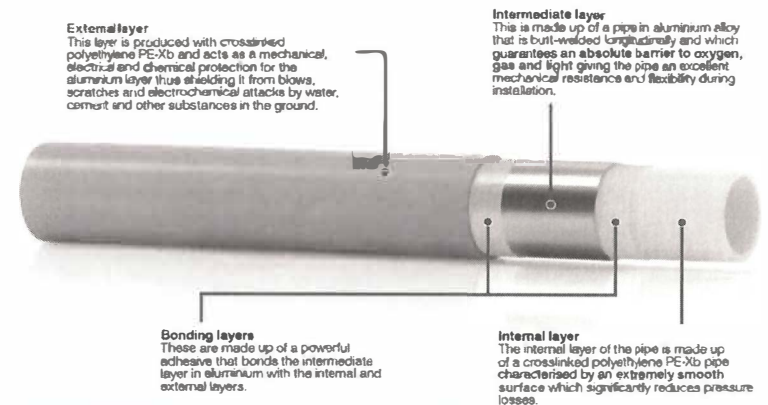
- Designed with Visual Confirmation Windows in fitting to ensure proper assembly
- Intentional and immediate leakage path to ensure complete press
- UV and concrete resistant
- Fire resistant material (rating of C-S2,D0 according to EN 13501-1)
- Improved lightning performance designed into system (bonding not required)
- Double O-ring sealing protection
- Customer and Associate safety improvement – potential reduction of injuries from cutting CSST

## Product Advantages

- ~50% faster installation (of fittings than CSST) due to press technology
- ~50% lighter in weight than CSST – ease of handling and installation
- Bendable pipes that retain shape
- Less turbulent flow => smaller pipe diameters than CSST Equivalent
- Recyclable

## Quality Manufacturing by Valsir

- Manufacturing experts in Cross Linked and High-Density Polyethylene, Fusion Welding and Aluminum Extrusions
- Production in Europe, Australia, Russia, additional technical support in South Africa and India
- In Business since 1987, 1 of 3 largest producers in Europe, \$60M sales of multilayered pipe (15% for gas application)
- Products widely used in high profile constructions in Italy, France, UAE, Australia, South Africa, etc.



Brass fitting, 2 o-rings, stainless steel sleeve

## ICC-ES PMG Product Certificate

PMG-1588



Effective Date: October 2020

This listing is subject to re-examination in one year.

[www.icc-es-pmg.org](http://www.icc-es-pmg.org) | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

CSI: DIVISION: 23 00 00—HEATING, VENTILATING AND AIR CONDITIONING (HVAC)  
Section: 23 11 00—Facility Fuel Piping

## Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Products: Jones Stephens PEX-AL-PEX Gas Pipe and Fitting System

Listee: Jones Stephens Corp.  
12500 Jefferson Avenue  
Newport News, VA 23602  
[www.ferguson.com](http://www.ferguson.com)

## Compliance with the following codes:

2021, 2018, 2015, 2012 and 2009 *International Fuel Gas Code*® (IFGC)  
2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)  
2021, 2018, 2015, 2012 and 2009 *Uniform Plumbing Code*® (UPC)\*

\*Copyrighted publication of the International Association of Plumbing and Mechanical Officials.

## Compliance with the following standards:

ASTM F1281-2017, Standard Specification for Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Pressure Pipe  
AS 4176.8-2010, Metal-Plastic Multilayer Pipes and Brass Fittings for Conveying Combustible Gases for System in Pressure Up to 5 bar.

## Identification:

**Pipe:** The Jones Stephens PEX-AL-PEX pipe shall be marked every 5 feet (1.5 m) with the following: company name or trademark, material (PEX-AL-PEX), nominal size (for example, 1216), temperature and pressure ratings, ASTM F1281 designation, production code, and the ICC-ES PMG listing mark.

**Fittings:** Fittings shall be marked with manufacturer's name or trademark, and the ICC-ES PMG listing mark.

## Installation:

Jones Stephens PEX-AL-PEX pipes must be installed in accordance with the manufacturer's published installation instructions, the applicable codes and this listing.

## Models:

Jones Stephens PEX-AL-PEX gas pipe is manufactured from cross-linked polyethylene (PEX) and aluminum materials satisfying ASTM F1281. Jones Stephens Gas pipe are yellow in color for gas applications.

Fittings of the following sizes can only be used on Jones Stephens PEX-AL-PEX gas pipe; fittings cannot be used with pipe from other manufacturer.

CODE	DESCRIPTION
PGP16328	16MM X 100M PIPE COIL
PGP20328	20MM X 100M PIPE COIL
PGP26164	26MM X 50M PIPE COIL
PGP32164	32MM X 50M PIPE COIL
PMPT16	16 X 2 X 1/2 MPT ADAPTER
PMPT20	20 X 2 X 1/2 IN ADAPTER MPT
PMPT26	26 X 3/4 IN ADAPTER MPT
PMPT32	32 X 1 IN ADAPTER MPT
PFPT16	16 X 2 X 1/2 IN ADAPTER FPT
PFPT20	20 X 2 X 1/2 IN ADAPTER FPT
PFPT26	26 X 3/4 IN ADAPTER FPT
PFPT32	32 X 1 IN ADAPTER FPT
PC16	16 X 16 COUPLING
PC20	20 X 20 COUPLING
PC26	26 X 26 COUPLING
PC32	32 X 32 COUPLING
PT16	16 X 16 X 16 TEE
PT20	20 X 20 X 20 TEE
PT26	26 X 26 X 26 TEE
PT32	32 X 32 X 32 TEE
PT162016	16 X 20 X 16 REDUCING TEE
PT201616	20 X 16 X 16 REDUCING TEE
PT201620	20 X 16 X 20 REDUCING TEE
PT202016	20 X 20 X 16 REDUCING TEE
PT202620	20 X 26 X 20 REDUCING TEE
PT261626	26 X 16 X 26 REDUCING TEE
PT262026	26 X 20 X 26 REDUCING TEE
PT321632	32 X 16 X 32 REDUCING TEE
PT262020	26 X 20 X 20 REDUCING TEE
PT262620	26 X 26 X 20 REDUCING TEE
PT322626	32 X 26 X 26 REDUCING TEE
PT322032	32 X 20 X 32 REDUCING TEE
PT322632	32 X 26 X 32 REDUCING TEE
PE916	16 X 16 90 DEG ELBOW
PE920	20 X 20 90 DEG ELBOW
PE926	26 X 26 90 DEG ELBOW
PE932	32 X 32 90 DEG ELBOW
PDE916D	16 X 1/2 IN FPT WB ELBOW
PDE920D	20 X 1/2 IN FPT WB ELBOW
PDE920F	20 X 3/4 IN FPT WB ELBOW
PDE926F	26 X 3/4 IN FPT WB ELBOW
PFPT916D	16 X 1/2 IN FPT ELBOW
PFPT920D	20 X 1/2 IN FPT ELBOW
PFPT920F	20 X 3/4 IN FPT ELBOW
PFPT926G	26 X 1 IN FPT ELBOW
PFPT926F	26 X 3/4 IN FPT ELBOW
PFPT932G	32 X 1 IN FPT ELBOW
PFWM16D	16 X 1/2 IN WALL/FLOOR MOUNT
PFWM20D	20 X 1/2 IN WALL/FLOOR MOUNT
PFWM20F	20 X 3/4 IN WALL/FLOOR MOUNT

PFWM26F	26 X 3/4 IN WALL/FLOOR MOUNT
PFWM26G	26 X 1 IN WALL/FLOOR MOUNT
PFWM32G	32 X 1 IN WALL/FLOOR MOUNT

## Conditions of Listing:

1. During placement of cover over the pipe, the pipe must be maintained at the greater of 1<sup>1</sup>/<sub>2</sub> times the proposed maximum working pressure, but not less 3 psig (20 kPa gauge), irrespective of design pressure.
2. The Jones Stephens PEX-AL-PEX pipe and fittings recognized in this listing shall be installed as a system and fittings shall be not used on pipes from other manufacturer.
3. The pipe installation must be pressure-tested for leaks in the presence of the code official or the code official's designated representative.
4. When installation is in fire-resistance-rated assemblies, evidence must be provided to the code official of compliance with *International Building Code*<sup>®</sup> (IBC) Section 713 (penetrations), *Uniform Building Code* (UBC) Section 709 (walls and partitions) or UBC Section 710 (floor/ceiling or roof/ceiling), as applicable.
5. The pipe must not be used as a source of electrical ground.
6. Pipe bends must be installed in accordance with the manufacturer's published installation instructions.
7. When the system is embedded in concrete, piping must be covered a minimum of <sup>3</sup>/<sub>4</sub> inch (19.1 mm) and installation must comply with IBC Section 1906.3 or UBC Section 1906.3, as applicable.
8. Pipe and Fittings recognized in this listing are under a quality control program with surveillance inspections two times per year by ICC-ES.