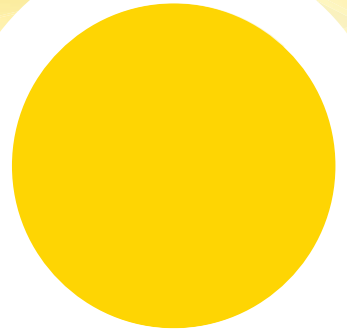


# PE 2708 CTS & IPS – GAS PIPE

## Designed for: Natural Gas Service & Distribution Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
- Yellow Pipe



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### Specifications:

- PE 2708 Resin formulation listed in PPI TR4
- Hydrostatic Design Basis: 1250 psi @ 73°F, 800 psi @ 140°F
- Cell Classification per ASTM D3350 = 234373E or 234375E
- MRS per ISO 9080 = 8.0 MPa (1160 psi)
- Charter Plastics Gas Pipe is produced to ASTM D2513 Specifications and is listed by NSF for compliance to ASTM D2513
- CSA B137.4 – Available only in coils in the following sizes:  
(1/2" CTS .090 wall), (1" CTS .099 wall), (3/4" SDR 11), (1" SDR 11), (1-1/4" SDR 11)  
(1-1/4' SDR 10), (1-1/2" SDR 11), (2" SDR 11)  
\*See the Pipe Size chart for sizes and DR's listed
- Pipe Test Category per ASTM D2513 = CDE
- Outdoor Storage = 3 years per ASTM D2513
- Charter Plastics Gas Pipe complies with DIMP (Distribution Integrity Management Program) marking requirements of the alpha-numeric code and corresponding bar code per ASTM F2897
- Charter Plastics Gas Pipe is marked "NR" designating there is no regrind content per 49 CFR 192
- Manufactured in Titusville, PA USA

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### Applications:

Charter Plastics PE 2708 Gas Pipe is designed for Natural Gas Distribution and Service Lines and for Propane LP Gas (Vapor).

*\*Charter Gas Pipe should never be used inside the building or structure. It should never be installed under the slab of a building. Always transition from polyethylene pipe to an appropriate product before entering the building, structure or basement.*



Pipe for a New World.

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### PE Pipe Design Criteria:

The design pressure for PE pipe is calculated based on the following equation:  
Design Pressure = [(2 x HDB at pipeline temperature) / (SDR-1)] x DF (Design Factor)

Table # 1

Interpolates the effect of HDB in accordance with PPITR3

**HDB Ratings are established at 73°F and at 140°F**

TEMPERATURE	HDB-LONG TERM HYDROSTATIC STRENGTH
73 ° F	1250 psi actual
100 ° F	1000 psi*
120 ° F	1000 psi*
140 ° F	800 psi actual

\*Data is interpolated

### Design Pressure Ratings:

In addition to the existing .32 DF (Design Factor), PHMSA (The Pipeline and Hazardous Materials Safety Administration ) issued a Plastic Pipe rule that allows the use of a .40 DF (Design Factor). The criteria to use a .40 DF (Design Factor) with PE pipe is shown in table 2.

*\*All Local, State and Federal Codes and Guidelines should be referenced when determining which DF is appropriate for your gas piping system.*

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Table # 2

## Design Factors for Gas Pipe

DESIGN FACTOR FOR NATURAL GAS DISTRIBUTION AND TRANSMISSION PER CFR 49 PART 192.121	DF (DESIGN FACTOR)
<p><b>DF of .40 is only for pipe that meets the following requirements:</b></p> <ul style="list-style-type: none"> <li>The material designation is PE2708 or PE 4710</li> <li>The design pressure <b>may not</b> exceed 125 psig</li> <li>Pipe must have a nominal pipe size (IPS or CTS) of 12" or less</li> <li>Pipe must meet the minimum wall thickness requirements per CFR 192.121.</li> <li>Pipe must have been produced <b>after</b> January 22, 2019</li> </ul>	<b>.40</b>

Charter Gas Pipe sizes shown in Table # 3 qualify for use with a .40 DF.

Table # 3

## **.40 DF (Design Factor) – Maximum Design Pressure Ratings** PE 2708 Natural Gas systems per CFR 49, Part 192.121

PIPE SIZES	DIMENSION RATIO	73° F (23° C) Psig	100° F (38° C) Psig	120° F (48° C) Psig	140° F (60° C) Psig
.50" CTS .090 wall	SDR 7	125†	125†	125†	107
.75" CTS .090 wall	SDR 9.7	115	92	92	74
.50" CTS .121	SDR 9.3	120	96	96	77
1.25" IPS	SDR 10	111	89	89	71
.75" IPS -4" IPS	SDR 11	100	80	80	64
3" IPS -4" IPS	SDR 11.5	95	76	76	61
4" IPS	SDR 13.5	80	64	64	51

† The design pressure is limited to 125 Psig

# PE 2708 CTS & IPS – GAS PIPE

Designed for: Natural Gas Service & Distribution  
Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
- Yellow Pipe

Table # 4

## Design Factors for Gas Pipe

DESIGN FACTOR FOR NATURAL GAS DISTRIBUTION AND TRANSMISSION PER CFR 49 PART 192.121	DF (DESIGN FACTOR)
<ul style="list-style-type: none"> <li>• For PE pipe not meeting the CFR 192.121 requirements for the .40 DF</li> <li>• The wall thickness of plastic pipe <b>may not be</b> &lt; .062"</li> </ul>	<b>.32</b>

Table # 5

## .32 DF (Design Factor) – Maximum Design Pressure Ratings PE 2708 Natural Gas systems per CFR 49, Part 192.121

DIMENSION RATIO	73° F (23° C) Psig	100° F (38° C) Psig	120° F (48° C) Psig	140° F (60° C) Psig
SDR 7	125†	107	107	85
SDR 9.3	96	77	77	62
SDR 9.7	92	74	74	59
SDR 10	89	71	71	57
SDR 11	80	64	64	51
SDR 11.5	76	61	61	49
SDR 12.5	70	56	56	45
SDR 13.5	64	51	51	41

Note:

Pipe produced after July 14, 2004 but before January 22, 2019 may use a design pressure of 125 Psig provided it:

- a. Has a material designation code of PE 2406 or PE 3408
- b. Has a nominal pipe size of ≤12"

For pipe with a nominal pipe size ≥14", the design pressure is limited to 100 Psig.

† The design pressure is limited to 125 Psig

# PE 2708 CTS & IPS – GAS PIPE

## Designed for: Natural Gas Service & Distribution Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
- Yellow Pipe

### Propane (LP Gas Vapor) Service:

Charter Plastics PE 2708 Gas pipe may be used for transporting Vapor LP-Gas in yard gas and underground distribution systems. It should only be used where the sizes, pressures and temperatures will not support condensation.

Refer to PPITR-22 “Polyethylene Piping Distribution Systems for Components of Liquid Petroleum Gases” for guidelines in using polyethylene pipe to transport propane gas.

- The pipe must be PE 2708 or PE 4710
- The resin should have an HDB of 1250 psi or greater
- Per ASTM D2513, “A Hydrostatic Design Basis of 1000 psi should be used in the design of PE pipe systems at temperatures of 73 ° F or lower”.
- NFPA 58 limits the maximum operating pressure of LP Gas Vapor service to **30 PSI @ 73.4°F**

### Safe Handling:

Large diameter HDPE pipe can be heavy and extreme caution should be used when unloading bundles of pipe. Applicable PPE (Personal Protection Equipment) and proper handling equipment should always be utilized.

When installing coils of pipe, caution should be used, as the energy contained within that coil is rapidly released when the tape or the bands restraining the coil are cut.

To safely handle and store polyethylene pipe, refer to The Plastic Pipe Institute’s “Material Handling Guide” and follow the Safety Guidelines established by the Gas Utilities as well as all local, state and federal guidelines.

### Installing:

***\*Always contact your local “Call Before You Dig” number and contact your local Gas Utility prior to any excavation, trenching or direction drilling.***

***\*Charter Gas Pipe should never be used inside the building or structure. It should be installed underground. It should never be installed under the slab of a building.***

Charter Pipe can be installed in open cut, horizontal directional drilling and re-lining installations.

Charter Plastics Gas pipe shall be installed in accordance with CFR 49 PART 192 and all applicable federal, state and local codes and regulations.

Transitions from polyethylene pipe to products appropriate for in-building use, should occur outside the building.

Buried pipe must be supported by proper embedment material like sand or gravel. Refer to PPI’s “Handbook of Polyethylene Pipe” and follow as local, state or federal guidelines.



# PE 2708 CTS & IPS – GAS PIPE

## Designed for: Natural Gas Service & Distribution Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
- Yellow Pipe

### Joining PE 2708 Pipe:

Charter Plastics Gas Pipe is based on outside diameters. Heat fusion is the preferred method for joining this pipe. Types of heat fusion include Butt, Socket, Saddle Fusion and Electrofusion.

All persons making fusions should be certified by the gas system operator and should follow the gas systems written fusion procedures. In addition, all DOT procedures should be followed when making joints to ensure the safety and the integrity of the system.

### As per D.O.T. Regulations:

- Each heat fusion joint (except for electrofusion joints), in a gas piping system must be made in accordance with ASTM F2620 -12. (incorporated by reference in Part 192.7). Per PHMSA Ruling on Nov. 20 2018, "although electrofusion joints and fittings are not covered under ASTM F2620, they would ultimately need to comply with ASTM F1055."
- All persons who make joints in polyethylene gas piping must be qualified under the operator's written procedures (CFR 49, Part 192.285(a))
- The gas system operator must ensure that all persons who make or inspect joints are qualified (CFR 49, Part 192.285(d) and 192.287)

Polyethylene pipe may also be joined with Stab or OD Mechanical fittings designed for pipe made to D2513 Standards. A stiffener should be inserted when using OD Compression type fittings. The stiffener should be sized specifically for the pipe being installed and it should be long enough to equal the insertion depth of the pipe.

***\*Check with the local gas utility for their guidelines and recommendations relative to using mechanical connections.***

***\*Never use any lubricant on the pipe. Do not expose the pipe to direct flame.***

### Liquid Hydrocarbon Permeation:

Permeation can occur with HDPE pipe that has been transporting fuel gasses or that has been installed in an area contaminated with Liquid Hydrocarbons. This permeation is not visibly detectable, but permeated pipe will exhibit bubbling when exposed to heat during the fusion process. When this is observed, the fusion process should be stopped. The section of heated pipe should be cut away and the pipe should be joined with a mechanical coupling.

Long term or excessive exposure to Liquid Hydrocarbons can affect the pipe's long-term Hydrostatic Strength and the system pressure should be evaluated to determine if a reduced DF (Design Factor) should be implemented.

# PE 2708 CTS & IPS – GAS PIPE

## Designed for: Natural Gas Service & Distribution Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
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### Squeeze Off:

Squeeze Off is a procedure that is used with HDPE and MDPE pipes to reduce or shut off flow. The pipe is squeezed between two parallel bars. When doing a squeeze off, follow ASTM F 1041 procedures and only use equipment meeting F1563 and approved by the pipe manufacturer and the gas utility.

**\*Never squeeze off more than once at the same point on the pipe.**

### Testing:

Hydrostatic testing is the preferred method over Pneumatic testing for identifying leaks. The safety concern being that if a catastrophic failure occurs during pneumatic testing with a compressed gas, the energy of both the compressed gas as well as the pipeline stress energies are released. With Hydrostatic testing, only the stress energy of the pipeline is released. **Consult the protocols set forth by the local gas companies as well as any local, state and federal codes before attempting leak testing. Utilize all safety precautions.**

### References:

**Code of Federal Regulations (CFR)**, U.S. Department of Transportation Pipeline Safety Regulations Title 49, Part 192 – “Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards.”

**ASME B31.8 and Addenda** – “Gas Transmission and Distribution Piping Systems.”

**American Gas Association (AGA)** – “Plastic Pipe Manual for Gas Service.”

**NFPA 58 Liquefied Petroleum Gas Code – 2020 Edition**

**2018 International Fuel Gas Code**

**API Specification 15LE, (R2013)** – Specification for Polyethylene Line Pipe (PE)

**Plastics Pipe Institute TR22-2013**, “Polyethylene Piping Distribution Systems for Components of Liquid Petroleum Gases



This product can expose you to chemicals, including Lead Chromate, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to: [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

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CTS PIPE SIZE	O.D. ACTUAL		CTS SDR 7	CTS SDR 9.7	CTS SDR 11.5	CTS SDR 12.5
.50"	.625	MIN WALL	.090†‡			
		CALC. ID.	.436	N/A	N/A	N/A
		WEIGHT PER FT	.065			
.75"	.875	MIN WALL		.090†		
		CALC. ID.	N/A	.684	N/A	N/A
		WEIGHT PER FT		.095		
1"	1.125	MIN WALL			.099†‡	.090‡
		CALC. ID.	N/A	N/A	.915	.934
		WEIGHT PER FT			.137	.126

Weight calculations per PPITR7

† Pipe sizes are listed by NSF International to ASTM D2513

‡ Pipe sizes listed with NSF International to CSA B137.4

Pipe sizes shaded in blue qualify for use with the .40 DF

Pipe sizes shaded in yellow **do not** qualify for the .40 DF and must use the .32 DF

Charter Plastics

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# PE 2708 IPS – GAS PIPE

Designed for: Natural Gas Service & Distribution  
Propane LP Gas (Vapor)

- Copper Tube Size & Iron Pipe Size - MDPE
- Yellow Pipe

IPS PIPE SIZE	O.D. ACTUAL		IPS SDR 9.3	IPS SDR 10	IPS SDR 11	IPS SDR 11.5	IPS SDR 13.5
.50"	.840	MIN WALL	.090†				
		CALC. ID.	.649	N/A	N/A	N/A	N/A
		WEIGHT PER FT	.091				
.75"	1.050	MIN WALL			.095†‡		
		CALC. ID.	N/A	N/A	.848	N/A	N/A
		WEIGHT PER FT			.122		
1"	1.315	MIN WALL			.120†‡		
		CALC. ID.	N/A	N/A	1.062	N/A	N/A
		WEIGHT PER FT			.193		
1.25"	1.660	MIN WALL		.166†‡	.151†‡		
		CALC. ID.	N/A	1.308	1.340	N/A	N/A
		WEIGHT PER FT		.334	.307		
1.5"	1.900	MIN WALL			.173†‡		
		CALC. ID.	N/A	N/A	1.533	N/A	N/A
		WEIGHT PER FT			.403		
2"	2.375	MIN WALL			.216†‡		
		CALC. ID.	N/A	N/A	1.917	N/A	N/A
		WEIGHT PER FT			.629		
3"	3.500	MIN WALL			.318†	.304†	
		CALC. ID.	N/A	N/A	2.825	2.855	N/A
		WEIGHT PER FT			1.365	1.312	
4"	4.500	MIN WALL			.409†	.391†	.333†
		CALC. ID.	N/A	N/A	3.633	3.670	3.794
		WEIGHT PER FT			2.257	2.168	1.874

Weight calculations per PPITR7

† Pipe sizes are listed by NSF International to ASTM D2513

‡ Pipe sizes are listed by NSF International to CSA B137.4

Pipe sizes shaded in blue qualify for use with the .40 DF

Charter Plastics

Polyethylene. Pipe. Partners.



Charter Plastics, Inc. is a privately held manufacturer of Polyethylene Pipe for Natural Gas, Water, Reclaimed Water, Sewer, Industrial, Geothermal and Irrigation pipe. Charter has been in business since 1987 and is recognized throughout the industry for providing superior quality pipe and outstanding service.

Based in Titusville, PA, Charter operates two pipe manufacturing facilities, an Engineering and Machining Division where tooling for manufacturing pipe is designed and built and a Fabrication Shop where custom manifolds and 6-24" HDPE fittings are fabricated.

Charter has made a long-term commitment to the natural gas industry and is an active member of multiple organizations that contribute to and develop standards for the gas industry including The Plastics Pipe Institute (PPI), The American Gas Association (AGA) and ASTM International.

For PE pipe designed for superior performance, choose Charter Plastics Gas Pipe.

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