

► **PE 2406/2708 IPS GAS PIPE**
Pressure Rated MDPE
Yellow Pipe

8/08

Designed for Natural Gas Distribution and Service lines

ASTM D2513

IPS PIPE SIZE	O.D. ACTUAL		IPS DR 7	IPS DR9	IPS DR 9.3	IPS DR 10	IPS DR 11	IPS DR 11.5	IPS DR 13.5
		Min. Wall	.120	.093	.090		.076		.062
½"	.840	Wt. Per 100'	11.8	9.7	9.5		8.3		7.1
		Min. Wall	.150	.117	.113		.095		.078
¾"	1.050	Wt per 100'	18.2	15.00	14.6		12.7		10.8
		Min. Wall	.188	.146	.141		.120		.097
1"	1.315	Wt per 100'	28.5	23.10	22.5		19.7		16.5
		Min. Wall	.237	.184	.178	.166	.151		.123
1-1/4"	1.660	Wt per 100'	45.3	36.60	35.5	33.4	30.9		26.0
		Min. Wall	.271	.211	.204		.173		.141
1-1/2"	1.900	Wt per 100'	59.4	48.00	46.6		40.3		33.8
		Min. Wall	.339	.264	.255	.238	.216		.176
2"	2.375	Wt per 100'	92.8	75.10	72.9	68.6	62.9		52.3
		Min. Wall	.500	.389	.376		.318	.304	.259
3"	3.50	Wt per foot	2.02	1.63	1.58		1.37	1.3	1.13
		Min. Wall	.643	.500	.484		.409	.391	.333
4"	4.50	Wt. Per foot	.3.33	2.69	2.62		2.30	2.2	1.87

PE 2406/2708 CTS- GAS TUBING
Pressure Rated MDPE
Yellow Pipe

Designed for Natural Gas Distribution and Service

ASTM D 2513

CTS PIPE SIZE	OD ACTUAL		CTS	CTS
		Min Wall	.090	
1/2"	.625	Wt per 100'	6.4	
		Min Wall	.090	
3/4"	.875	Wt per 100'	9.4	
		Min Wall	.090	.099
1"	1.125	Wt per 100'	12.6	13.7
		Min Wall	.090	
1-1/4"	1.375	Wt per 100'	15.6	

* Minimum order may be required – Please contact Charter Plastics for details

► **PE 2406/2708 IPS & CTS - GAS PIPE AND TUBING**
Yellow

SPECIFICATIONS:

PE 2406/2708 Resin formulation
1250 psi @ 73 °F Hydrostatic Design Basis listed in PPI TR4
800 psi @ 140 °F Hydrostatic Design Basis listed in PPI TR4
ASTM D 2513
ASTM D 1248
Cell Classification per ASTM D3350 = 234363E

Design Service Factor of .32 for natural gas (distribution)
Design Service Factor of .25 for Vapor Liquid Propane -Gas piping system

Temperature and Hydrostatic Design Basis (HDB)

Temperature factors must be considered in the design of a gas pipeline.

As per CFR 49 192.123:

“Plastic pipe may not be used when operating temperature of the pipe will be <20°F or < 40°F if all pipe and pipeline components whose operating temperature will be below -29°F have a temperature rating by the manufacturer consistent with that operating temperature.”

Table # 1 interpolates the effect of temperature on HDB in accordance with PPI TR 3

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

Table # 1.

Temperature	HDB-Long Term Hydrostatic Strength
73 ° F	1250 psi
100 ° F	1055 psi
120 ° F	923 psi
140 ° F	800 psi

Design Criteria:

The design pressure for plastic pipe is calculated based on the following equation:

$$\text{Design Pressure} = \frac{2 (\text{HDB at pipeline temperature}) \times \text{Design Service Factor (natural gas .32)}}{\text{SDR} - 1}$$

Table # 2

Maximum Allowable Operating Pressures for PE 2406/2708 Natural Gas systems:

SDR	Design Rating @ 73.4 °F	MAOP @ 73.4 °F	Design Rating @ 100°F	MAOP @ 100 °F	Design Rating @ 120° F	MAOP @ 120°F	Design Rating @ 140°F	MAOP @ 140°F
9	100 psi	100 psi	84 psi	84 psi	74 psi	74 psi	80 psi	80 psi
9.3	96 psi	96 psi	81 psi	81 psi	71 psi	71 psi	77 psi	77 psi
10	89 psi	89 psi	75 psi	75 psi	65 psi	65 psi	71 psi	71 psi
11	80 psi	80 psi	67 psi	67 psi	59 psi	59 psi	64 psi	64 psi
11.5	76 psi	76 psi	64 psi	64 psi	56 psi	56 psi	61 psi	61 psi
13.5	64 psi	63 psi	54 psi	54 psi	47 psi	47 psi	51 psi	51 psi

Design Pressure Rating is based on the formula listed above using a design factor of .32 for natural gas.

† If used in areas where pressures over 100 psi are allowed, Federal Regulations limit the MAOP to ≤ 125 psi on ≤ 12” pipe, unless a waiver is granted. Please see CFR 49 192.123 to review complete design criteria.

Propane (LPG) Gas Service:

Charter Plastics **PE 2406/2708** Gas pipe may be used for transporting liquefied petroleum gas (Vapor LP Gas).

NFPA 58 limits the maximum operating pressure to 30 PSI @ 73.4°F

For Propane gas service, a Hydrostatic Design Basis of 1000 psi @ 73° F should be used to design the system and a design service factor of .25 should be utilized.

NFPA limits the size of PE pipe to 2” Nominal Pipe size with an OD of 2.375”.

Polyethylene pipe should only be used in underground distribution systems of Vapor LP Gas in applications where the sizes, pressures and temperatures will not support condensation.

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

Outdoor Storage:

Prior to shipment, all Charter Gas pipe is stored indoors. Charter PE 2406/**2708** pipe is stabilized for extended unprotected outdoor storage.

Joining:

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

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 safety and the integrity of the system.

Electrofusion is also an acceptable method of joining polyethylene pipe.

Polyethylene pipe may also be joined with OD Mechanical fittings designed for pipe made to D 2513 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.

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

Application:

Charter Plastics **PE 2406/2708** Gas Pipe is designed for transporting natural gas or propane. This product is designed for direct burial. It is not designed for inside applications. Transition from polyethylene pipe to an appropriate product before entering the building or basement.

Installing:

Charter Plastics Polyethylene Gas pipe shall be installed in accordance with C.F.R.49 PART 192, Subpart G (mains) or Subpart H (service lines) and all applicable federal, state and local codes and regulations.

Charter Gas pipe is designed for direct burial. Depending on the application, casing may be required. Check your local and state guidelines.

Mains shall be installed with a minimum of 24” of cover unless local or state codes prevail.

Service lines must be installed with at least 12” on private property and a minimum of 18” of cover under streets and roads.

Buried pipe must be fully supported by proper embedment material. Refer to C.F.R. 49 Part 192, Subpart H and to PPI’s “Handbook of Polyethylene Pipe” and follow as local, state or federal guidelines.

Safe Handling:

To safely handle and store polyethylene pipe, refer to PPI’s “Material Handling Guide”.

Testing:

Hydrostatic testing is preferred method for identifying leaks over Pneumatic testing. The safety concern being that if catastrophic failure occurs during pneumatic testing with a compressed gas, the energy of both the compressed gas as well as the pipeline stress energy 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 pneumatic 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 – 2004 Edition

National Fuel Gas Code

API Specification 15LE, Third Edition, 1995 – Specification for Polyethylene Line Pipe (PE)

Plastics Pipe Institute TR22-2000, “Polyethylene Piping Distribution Systems for Components of Liquid Petroleum Gases: