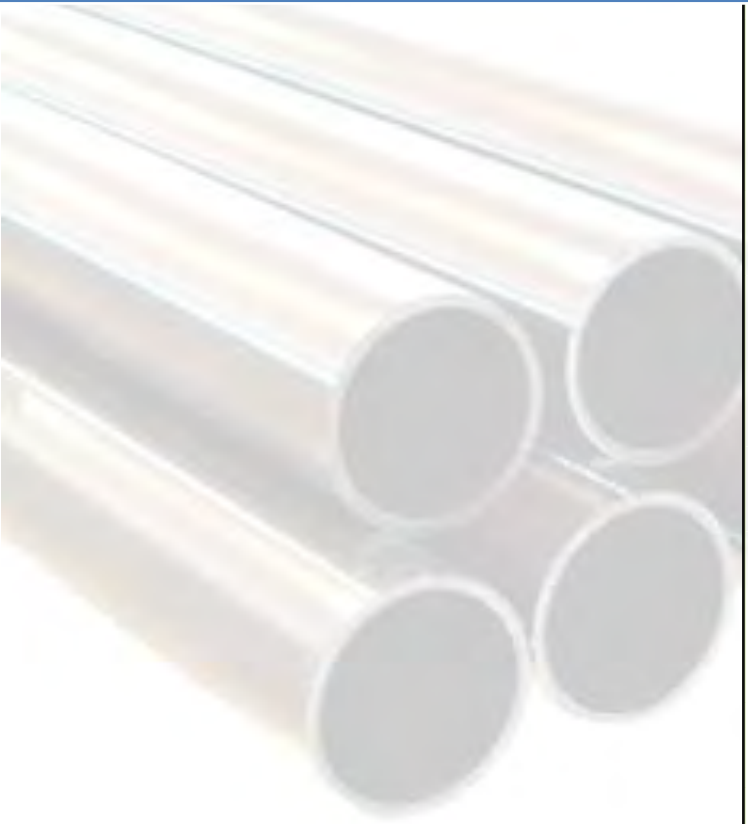
FLYING W

PLASTICS, INC.

CATALOG



Locations:

487 Van Horn Drive, Glenville, WV 26351

Contact:

800-327-4735 office / 304-462-7657 fax

flyingwplastics.com

sales@fwplastics.com – for quotes and assistance

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General Pipe Data

The following general pipe data can be found at the back of the catalog.

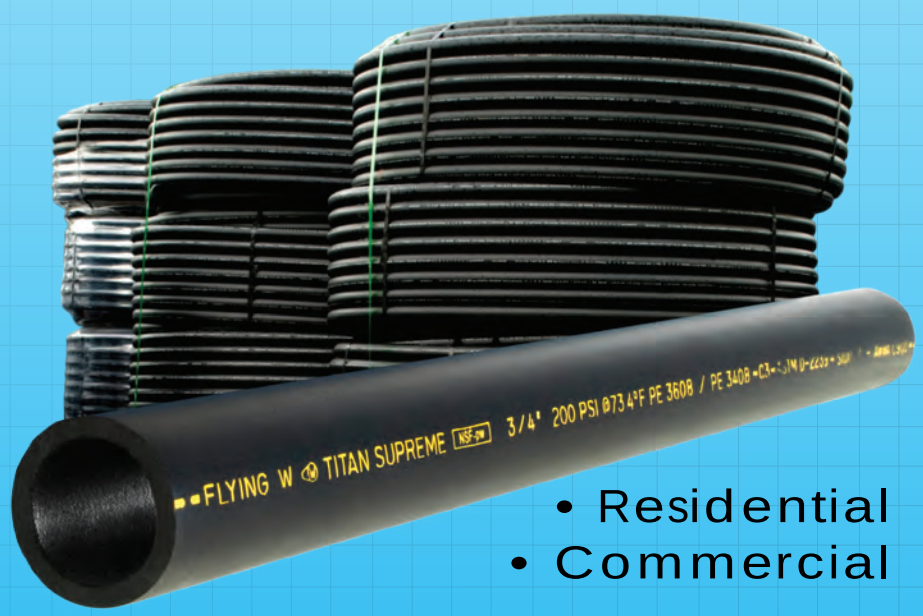
-Size and Dimension Charts- *-Recommended Butt Fusion Procedure-*
-Truckload Quantity Tables- *-HDPE Chemical Resistance List-*

POTABLE WATER PIPE

TITAN SUPREME

Potable & Non-Potable High-Density Polyethylene Water Pipe & Tubing

PRODUCT SPECIFICATIONS



- Residential
- Commercial

FLYING W PLASTICS, INC.

www.flyingwplastics.com

Flying W Plastics, Inc. | 487 Vanhorn Dr. • PO Box 759 | Glenville, WV 26351

304.462.5779 ph • 800.327.4735 sales • 304.462.7657 fx

POTABLE WATER PIPE

TITAN SUPREME

OVERVIEW

Titan Supreme is manufactured in accordance with ASTM D-2239 specifications, and is designed for use in pressure applications for potable water. This is an inside diameter (I.D.) controlled pipe (IDR) with operating water pressures of 125psi, 160psi, 200psi, and 250psi at 23 °C (73 °F), depending on wall thickness. Titan Supreme has NSF Standard 14 certification and meets AWWA C901 specifications, as well as NSF/ANSI standard 61 certification. Titan Supreme is also available in copper tubing size (C.T.S.) O.D. controlled DR9 made to ASTM D2737, and is available made from PE3608 material on special orders. It is manufactured with a PE4710 Class C high density polyethylene resin (see ASTM D-2239, and/or ASTM D-3350 for detailed specifications) and is available in various sizes and lengths.

Titan Supreme is color-coded by wrapping each coil with color tape to indicate the pressure rating (PSI) and the exact footage of the coil. This same color is also found on the print line of the pipe itself, eliminating costly inventory and shipping problems. Color codes are Blue (125 PSI), Red (160 PSI), White (200 PSI), Yellow (250 PSI), and Orange (250 PSI [C.T.S.]).

50-Year Limited Warranty

Flying W Plastics warrants its Titan Supreme, Titan Supreme C.T.S., Spec I, and Spec II pipe against rot, rust, material flaws, structural weaknesses and electrolytic corrosion and warrants it to be free from defect in materials and workmanship for a period of fifty (50) years from date of purchase by and to the original purchaser only. Flying W Plastics expressly limits its responsibility under this Limited Warranty to the following:

1. Flying W Plastics Inc., will provide an equivalent amount of plastic pipe of like size and grade to that amount which it acknowledges to be defective, to the original installer only.

2. Flying W Plastics, Inc., will pay up to one dollar ($1.00) per lineal foot for labor charges actually incurred by the original purchaser in replacement of pipe warranted hereby, which pipe is acknowledged to be defective within five (5) years of the date of purchase by the original installer only, with a pro rata reduction of said amount thereafter for the remaining forty-five (45) years of this Limited Warranty.

A sample measuring a minimum of twenty-four inches (24") in length, bearing the Flying W Plastics trademark, for any segment of pipe alleged by the original purchaser only to be defective, must be submitted to Flying W Plastics for inspection and testing. Any plastic pipe of Flying W Plastics thereafter acknowledged to be defective shall be exchanged as aforesaid, and Flying W Plastics shall assume the reasonable costs of transportation thereof to the point of the original delivery.

Purchaser and/or installer assumes all risk and liability for loss, damages or injury to persons or property of buyer or other parties arising out of use or possession of materials and products of Flying W Plastics, Inc.

Exclusions:
There are no warranties which extend beyond the description on the face thereof. Flying W Plastics disclaims any express or implied warranties of merchantability and fitness for a particular purpose. Flying W Plastics shall not be liable for special, indirect, incidental or consequential damages related to a defect of the pipe.

For the warranty to be valid pipe must be installed in accordance with accepted and approved industry guidelines and procedures.

Warranty does not apply to any fusion joining process or any other method or device used to join the pipe.

Warranty does not apply to the design or installation of the system or any other component of the system.

There are no warranties which extend beyond the description on the face thereof.

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POTABLE WATER PIPE
TITAN SUPREME

NSF LISTINGS DESIGN CRITERIA

NSF International (NSF) Official Listing

Potoble Water Pipe

The following products are certified by NSF to conform to the requirements of NSF Standard 14 – Plastics Piping Components and Related Materials & NSF/ANSI Standard 61- Health Effects Requirements.

Material Class: PE3608 or PE4710; **Trade Designation:** Flying W Titan Supreme
Performance Standard: ASTM D2239

½" thru 2" IDR 5.3	½" thru 2" IDR 7	½" thru 2" IDR 9
½" thru 6" IDR 11.5	½" thru 6" IDR 15	½" thru 6" IDR 19

Material Class: PE3608 or PE4710; **Trade Designation:** Flying W Spec I
Performance Standard: ASTM D3035

½" thru 6" DR 7	½" thru 6" DR 9	½" thru 6" DR 11
½" thru 6" DR 13.5	½" thru 6" DR 17	½" thru 6" DR 21

Material Class: PE3608 or PE4710; **Trade Designation:** Flying W Titan Supreme
Performance Standard: ASTM D2737

½" thru 2" (C.T.S.) DR 9	½" thru 2" (C.T.S.) DR 11

Material Class: PE3608 or PE4710; **Trade Designation:** Flying W Spec II
Performance Standard: ASTM F14

3" thru 18" (IPS or DIPS) DR 7.3	3" thru 18" (IPS or DIPS) DR 9	3" thru 18" (IPS or DIPS) DR 9.3
3" thru 18" (IPS or DIPS) DR 11	3" thru 18" (IPS or DIPS) DR 13.5	3" thru 18" (IPS or DIPS) DR 15.5
3" thru 18" (IPS or DIPS) DR 17	3" thru 18" (IPS or DIPS) DR 21	3" thru 18" (IPS or DIPS) DR 26
3" thru 18"(IPS or DIPS) DR 32.5		

Flying W Plastics & PPI

Flying W Plastics, Inc. is a member in good standing with the Plastics Pipe Institute (PPI). PPI is the major trade association representing all segments of the plastics piping industry. As an association, PPI focuses collaborative efforts to accumulate data, concentrate facts and target resources toward advancements in plastics piping application and usage. PPI promotes contemporary use of plastics piping for water and gas distribution, sewer and wastewater, oil and gas production, industrial and mining uses, power and communications, and ducting and irrigation.

PPI's vision and leadership have resulted in the establishment of uniform testing and design criteria that has become the foundation for all current applications of plastics piping. As PPI members, Flying W Plastics recommends PPI's *Handbook of Polyethylene Pipe, Second Edition* for testing and design criteria of all HDPE pipe manufactured by Flying W Plastics. This handbook is available for purchase online (**www.plasticpipe.org**). The individual chapters can be downloaded free of charge (**www.plasticpipe.org/publications/pe_handbook.html**). Many case studies, technical bulletins, and pipe calculations can also be found at the PPI web site.

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POTABLE WATER PIPE
TITAN SUPREME

PROPERTIES & PRODUCT SPECS

Material Properties PE4710

The PE4710 materials offer higher working pressures in most applications than PE3608. Flying W certifies that its PE4710 Titan Supreme Potable Water Pipes are manufactured from high-quality HDPE copolymers having the typical properties listed. These copolymers have NSF 14 and AWWA C901 certification for potable water applications, comply with ANSI/NSF Standard 61 health effects requirement, and are recognized by the Plastics Pipe Institute as having a pipe material designation code of PE4710 & PE100.

Typical Properties (1)	English	SI Units	ASTM Method
Density Black	-	.959 g/cc	D 4883
Melt Index[2]	-	8.0 g/10 min	D 1238
Tensile Strength			
@ Yield (2 in/min)	3625 psi	25.0 MPa	D 638
@ Break (2 in/min)	5500 psi	38.0 MPa	D 638
Elongation @ Break (2 in/min)	>600%	>600%	D 638
Flexural Modulus[3]	150,000 psi	1.035 MPa	D 790
Notched Izod Impact Strength	9 ft-lbf/in	0.49 kj/m	D 256
Hardness (Shore D)	66	66	D 2240
Vicat Softening Point	259 °F	126 °C	D1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis			
@ 23 °C	1600 psi	11.0 MPa	D 2837
@ 60 °C	1000 ps1	6.9 MPa	D 2837
Minimum Required Strength	-	100 MPa	ISO 9080
Environmental Stress Crack Resistance[4]	>5000 hrs	>5000 hrs	D 1693
Notch Tensile (PENT)	75,000 hrs	75,000hrs	F 1473
Carbon Black Concentration	2.3%	2.3%	D 1603
Cell Classification	445574C	445574C	D 3350

(1) *Typical properties will vary within specification limits;*
(2) *190 °C / 21,100g;*
(3) *2% Secant-Method 1*
(4) *Condition C*

POTABLE WATER PIPE

TITAN SUPREME

PRODUCT SPECS

ASTM D2239 POLYETHYLENE PLASTIC PIPE

Based on controlled inside diameter water pipe; Meets or exceeds NSF Standard 14 and AWWA C901.

125 PSI
TITAN SUPREME
IDR 15 PE4710

other lengths available on request

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	Max. ft. Truckload	List Per 100'
½"	W47121100 W47121200 W47121400	0.622"	0.060"	6.1#	100' 200' 400'	180,000'	$12.68
¾"	W47122100 W47122200 W47122400	0.824"	0.060"	7.9#	100' 200' 400'	110,000'	$16.28
1"	W47123100 W47123200 W47123300	1.049"	0.070"	10.9#	100' 200' 300'	90,000'	$24.18
1 ¼"	W47124100 W47124300	1.380"	0.092"	18.8#	100' 300'	50,000'	$41.80
1 ½"	W47125100 W47125250 W47125300	1.610"	0.107"	25.6#	100' 250' 300'	32,000'	$63.78
2"	W47126100 W47126200	2.067"	0.138"	42.2#	100' 200'	28,000'	$102.83

160 PSI
TITAN SUPREME
IDR 11.5 PE4710

other lengths available on request

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	Max. ft. Truckload	List Per 100'
½"	W47161100 W47161200 W47161300 W47161400	0.622"	0.060"	6.1#	100' 200' 300' 400'	180,000'	$14.25
¾"	W47162100 W47162400	0.824"	0.072"	8.9#	100' 400'	110,000'	$19.90
1"	W47163100 W47163300 W47163500	1.049"	0.091"	14.5#	100' 300' 500'	90,000'	$31.65
1 ¼"	W47164100 W47164300	1.380"	0.120"	25.0#	100' 300'	50,000'	$54.70
1 ½"	W47165100 W47165250	1.610"	0.140"	34.1#	100' 250'	32,000'	$78.85
2"	W47166100 W47166200	2.067"	0.180"	56.2#	100' 200'	28,000'	$132.98

200 PSI
TITAN SUPREME
IDR 9 PE4710

other lengths available on request

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	Max. ft. Truckload	List Per 100'
½"	W47201100 W47201200 W47201300 W47201400	0.622"	0.069"	6.7#	100' 200' 300' 400'	180,000'	$15.30
¾"	W47202100 W47202400	0.824"	0.092"	11.7#	100' 400'	110,000'	$24.38
1"	W47203100 W47203300 W47203500	1.049"	0.117"	18.9#	100' 300' 500'	90,000'	$39.40
1 ¼"	W47204100 W47204300	1.380"	0.153"	32.7#	100' 300'	50,000'	$68.00
1 ½"	W47205100 W47205250	1.610"	0.179"	44.6#	100' 250'	32,000'	$109.00
2"	W47206100 W47206200	2.067"	0.230"	73.5#	100' 200'	28,000'	$180.20

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POTABLE WATER PIPE

TITAN SUPREME

PRODUCT SPECS

ASTM D2239 POLYETHYLENE PLASTIC PIPE

Based on controlled inside diameter water pipe; Meets or exceeds NSF Standard 14 and AWWA C901.

250 PSI
TITAN SUPREME
IDR 7 PE4710

other lengths available on request

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	Max. ft. Truckload	List Per 100'
½"	W47251100 W47251400	0.622"	0.089"	8.8#	100' 400'	180,000'	$20.45
¾"	W47252100 W47252400 W47252500 W472521000	0.824"	0.118"	15.5#	100' 400' 500' 1000'	110,000'	$32.00
1"	W47253100 W47253300 W47253500 W472531000	1.049"	0.150"	25.1#	100' 300' 500' 1000'	90,000'	$51.28
1 ¼"	W47254100 W47254300 W47254500	1.380"	0.197"	43.4#	100' 300' 500'	50,000'	$87.93
1 ½"	W47255100 W47255250 W47255500	1.610"	0.230"	59.0#	100' 250' 500'	32,000'	$144.85
2"	W47256100 W47256200 W47256500	2.067"	0.295"	97.3#	100' 200' 500'	28,000'	$230.38

ASTM D2737 POLYETHYLENE PLASTIC TUBING

Copper Tube Sized (C.T.S.) water pipe; Based on controlled outside diameter; Meets or exceeds NSF Standard 14 and AWWA C901.

250 PSI
TITAN SUPREME
C.T.S. DR 9
PE4710

other lengths available on request

Sizes	Part Number	Nominal O.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	Max. ft. Truckload	List Per 100'
½"	C47251100 C47251400	0.625"	0.069"	5.5#	100' 400'	160,000'	$20.85
¾"	C47252100 C47252400 C47252500	0.875"	0.097"	10.4#	100' 400' 500'	100,000'	$23.96
1"	C47253100 C47253300 C47253500 C472531000	1.125"	0.125"	17.2#	100' 300' 500' 1000'	85,000'	$36.38
1 ¼"	C47254100 C47254300 C47254500	1.375"	0.153"	25.7#	100' 300' 500'	42,000'	$54.70
1 ½"	C47255100 C47255250 C47255500	1.625"	0.181"	35.8#	100' 250' 500'	28,000'	$83.55
2"	C47256100 C47256200 C47256500	2.125"	0.236"	61.3#	100' 200' 500'	23,000'	$142.63

Now available in solid blue for water identification.
Ask for Flying W Plastics Titan Supreme Blue.

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POTABLE WATER PIPE

TITAN SUPREME

NON-POTABLE WATER PIPE

NON-POTABLE WATER POLYETHYLENE PLASTIC PIPE (IDR)

Pioneer Utility HDPE

Based on controlled inside diameter water pipe; Made from selected non-potable-rated resins.

Maximum Working Water Pressure - 100 PSI

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	Coil/Joint Length/ft	List Per 100'
½"	UP1011 UP1014	0.622"	0.060"	5.8#	100' 400'	$9.41
¾"	UP1021 UP1024	0.824"	0.060"	7.5#	100' 400'	$12.09
1"	UP1031 UP1032 UP1033	1.049"	0.070"	10.8#	100' 200' 300' 500' 1000'	$17.97
1 ¼"	UP1041 UP1043	1.380"	0.092"	18.7#	100' 400'	$31.08

Maximum Working Water Pressure - 80 PSI

Sizes	Part Number	Nominal I.D.	Wall Thickness	Weight Per 100'	List Per 100'
1½"	UP1051 UP1052 UP1053	1.610"	0.107"	25.4#	$46.14
2"	UP1061 UP1062	2.067"	2.067"	41.6#	$75.56
3"	UP1071	3.068"	3.068"	90.5#	$164.45

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FLYING W PLASTICS

1/2" to 20"

Municipal & Industrial High-Density Polyethylene Pipe

PRODUCT SPECIFICATIONS

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800-327-4735 (sales)
For Quote Requests: sales@fwplastics.com

OVERVIEW

MUNICIPAL • INDUSTRIAL HDPE PIPE

Flying W Plastics' high-density polyethylene municipal and industrial pipe can be manufactured to meet several industry standards including ASTM, AWWA, NSF, and other custom standards upon request. Different applications can require the pipe to be manufactured and labeled differently. Since Flying W Plastics manufactures pipes for a wide variety of applications, and since some standards may not be suitable for all applications, it is imperative that the customer review all standards prior to purchase and request quotations for pipe manufactured to meet their specific requirement.

Flying W Plastics manufactures the following products:

Spec I & Spec II - These HDPE pipes are manufactured from select PE4710 materials designed to give outstanding performance and longevity specifically for municipal water, sewer, and various industrial applications. These pipes are available in sizes 1/2"-20" and are available as black pipe or with color-coded stripes. These pipes comply with AWWA C901 (3" and smaller sizes), AWWA C906 (4" and larger sizes), and can be NSF-PW listed for potable water, if so specified. They are manufactured in compliance with the requirements of ASTM F714 (4" and larger), ASTM D3035 (3" and smaller), and meet the cell classification of PE445574C as specified in ASTM D3350.

Pioneer Industrial - These HDPE pipes are manufactured from select PE4710 resins and meet the cell classification of PE445574C as per ASTM D3350. These pipes are designed to provide excellent performance in applications such as mining, landfills (both solid and perforated pipes available), hydraulic fracturing, process fluids and a wide variety of industrial applications. They are manufactured to meet the requirements of ASTM F714 (4" and larger) and ASTM D3035 (3" and smaller), and meet the cell classification of PE445574C as specified in ASTM D3350. Available in sizes 1 /2"-20".

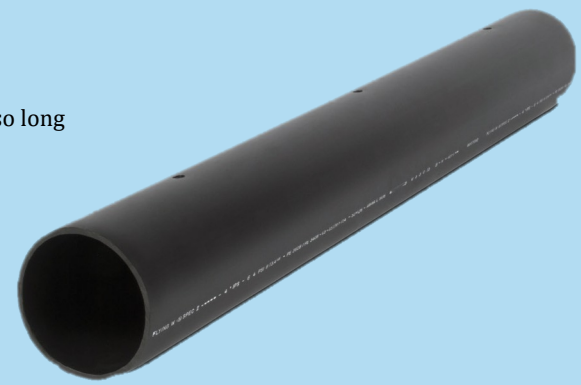
I.P.S. and D.I.P.S. pipe can be easily connected by fusion processes. Flying W Plastics recommends either butt fusion, socket fusion, or electrofusion, and can provide the recommended guidelines and procedures for connecting municipal and industrial pipe utilizing these methods.

PE 4710 Pressure Chart								
PE 4710 – 3" to 20" ASTM F714 SPEC I, SPEC LL & Pioneer Industrial								
DR 32.5	DR 26	DR 21	DR 17	DR 13.5	DR 11	DR 9	DR 7.3	DR 7
65 PSI	80 PSI	100 PSI	125 PSI	160 PSI	200 PSI	250 PSI	317 PSI	335 PSI
PE 4710 – 1/2" to 20" ASTM D3035 SPEC I, SPEC II & Pioneer Industrial								
DR 32.5	DR 26	DR 21	DR 17	DR 13.5	DR 11	DR 9	DR 7.3	DR 7
65 PSI	80 PSI	100 PSI	125 PSI	160 PSI	200 PSI	250 PSI	317 PSI	335 PSI

Custom Perforation

Flying W Plastic also offers its 4"-20" Pioneer Industrial, Sparta Gas, and Spec II piping custom perforated. We can do a wide variety of patterns and hole sizes done in line as a cost and labor saving alternative to shipping pipe to a perforation facility, making the perforations, re-bundling the pipe, and shipping onto a job site. Our inline perforation capabilities are wide ranging, but there are some limits, as follows:

- Perforations must be round holes 1/4" to 1" in diameter.
- A limit of 8 perforated rows to complete pattern.
- Spacing can be 3" to 20".
- Holes can be lined up or staggered (off-set).
- The angles between rows of holes are infinitely adjustable so long as no two rows are closer than 20 degrees apart.
- Any staggering profiles must repeat in 20" or less.



Material Properties PE4710

The PE4710 materials offer higher working pressures in most applications than PE3608. Flying W certifies that its Municipal and Industrial PE4710 Pipes are manufactured from high-quality HDPE copolymers having the typical properties listed. These high-density copolymers meet the specifications set forth in ASTM D3035, ASTM F714, and ASTM D3350. These products are designed and manufactured specifically for use in municipal, industrial, mining, water transfer, slurries, irrigation, and landfill applications. For potable water applications, Flying W Plastics' Spec I & Spec II pipes have NSF-PW, AWWA C901, and AWWA C906 certifications and comply with ANSI/NSF Standard 61 health effects requirement.

Typical Properties (1)	English	SI Units	ASTM Method
Density Block	-	.959g/cc	D4883
Melt Index (High Load) (2)	-	8.0g/10min	D1238
Melt Index (3)	-	0.10g/10min	D1238
Tensile Strength			
@Yield (2in/min)	3625 psi	25.0 MPa	D638
@Break (2in/min)	5500 psi	38.0 MPa	D638
Elongation@ Break (2 in/min)	>600%	>600%	D638
Flexural Modulus (4)	150,00 psi	1.035 MPa	D790
Notched lzod Impact Strength	9 ft-lbf/in	0.49 kj/m	D256
Hardness (Shore D)	66	66	D2240
Vicot Softening Point	259 ° F	126 °C	D1525
Brittleness Temperature	<-180°F	<-118 °C	D746
Hydrostatic Design Basis			
@ 23°C	1600 psi	11.0 MPa	D2837
@ 60°C	1000 psi	6.9 MPa	D2837
Minimum Required Strength	-	100 MPa	ISO 9080
Environmental Stress Crock Resistance (5)	>1000 hrs	>1000 hrs	D1693
Notch Tensile (PENT)	>5000 hrs	>5000 hrs	F1473
Carbon Block Concentration	2.3%	2.3%	D1603
Cell Classification	445574C	445574C	D3350

(1) Typical Properties will vary within specification limits;
(2) 190 ° C / 21.100 kg
(3) 190 ° C / 2.16 kg
(4) 2% Secant - Method 1
(5) Condition C

MUNICIPAL • INDUSTRIAL HDPE PIPE

PRODUCT SPECS

IRON PIPE SIZES - OUTSIDE DIAMETER / DR 7, 7.3, 9, 11, 13.5

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

I.P.S. Data

- ASTM F714 Sizes 4" to 20"
- ASTM D3035 Sizes 1 /2" to 3"

All pipe is manufactured from select PE4710 resins unless requested otherwise at the time of quote. While PE4710 resins are used, these resins meet or exceed the pressure ratings and physical properties of PE3608/3408 resins.

		IPS DR - 7 335 psi			*IPS DR - 7.3 317 psi*			*IPS DR - 9 250 psi*			*IPS DR - 11 200 psi*			*IPS DR - 13.5 160 psi*		
Pipe Size	Nom. OD	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)
1/2"	0.840	0.120	0.58	0.118	0.115	0.59	0.114	0.093	0.64	0.096	0.076	0.67	0.08	0.062	0.70	0.071
3/4"	1.050	0.150	0.73	0.185	0.144	0.74	0.18	0.117	0.80	0.15	0.095	0.84	0.125	0.078	0.88	0.104
1"	1.315	0.188	0.91	0.29	0.180	0.93	0.28	0.146	1.00	0.235	0.120	1.06	0.197	0.097	1.10	0.163
1-1/4"	1.660	0.237	1.15	0.462	0.227	1.17	0.447	0.184	1.26	0.374	0.151	1.34	0.313	0.123	1.39	0.26
1-1/2"	1.900	0.271	1.32	0.606	0.260	1.34	0.585	0.211	1.45	0.49	0.173	1.53	0.411	0.141	1.60	0.341
2"	2.375	0.339	1.65	0.947	0.325	1.68	0.914	0.264	1.81	0.766	0.216	1.91	0.642	0.176	2.00	0.533
2-1/2"	2.875	0.411	2.00	1.39	0.389	2.05	1.34	0.319	2.19	1.12	0.261	2.32	0.94	0.213	2.42	0.781
3"	3.500	0.500	2.44	2.06	0.479	2.48	1.99	0.389	2.67	1.66	0.318	2.82	1.39	0.259	2.95	1.16
4"	4.500	0.643	3.13	3.40	0.616	3.19	3.28	0.500	3.44	2.75	0.409	3.63	2.30	0.333	3.79	1.91
5"	5.563	0.795	3.87	5.19	0.762	3.94	5.02	0.618	4.25	4.20	0.506	4.49	3.52	0.412	4.68	2.93
6"	6.625	0.946	4.61	7.37	0.908	4.70	7.12	0.736	5.06	5.96	0.602	5.34	4.99	0.491	5.58	4.15
8"	8.625	1.232	6.01	12.49	1.182	6.12	12.06	0.958	6.59	10.10	0.784	6.96	8.46	0.639	7.27	7.03
10"	10.750	1.536	7.49	19.40	1.473	7.62	18.74	1.194	8.21	15.68	0.977	8.67	13.14	0.796	9.06	10.92
12"	12.750	1.821	8.88	27.28	1.747	9.04	26.36	1.417	9.74	22.06	1.159	10.29	18.49	0.944	10.74	15.36
14"	14.000	2.000	9.76	32.93	1.918	9.93	31.51	1.556	10.70	26.60	1.273	11.30	22.29	1.037	11.80	18.52
16"	16.000	2.286	11.15	43.01	2.192	11.35	41.15	1.778	12.23	34.74	1.455	12.91	29.12	1.185	13.48	24.19
18"	18.000	2.571	12.54	54.43	2.466	12.77	52.08	2.000	13.76	43.97	1.636	14.53	36.85	1.333	15.17	30.62
20"	20.000	2.857	13.94	67.20	2.74	14.19	64.30	2.222	15.28	54.34	1.818	16.14	45.54	1.481	16.86	37.84

O.D. controlled water/fluids pipe.
Recommended for municipal, industrial, and government applications. Easily connects by fusing, eliminating the need for common connections.

MUNICIPAL • INDUSTRIAL

HDPE PIPE

PRODUCT SPECS

IRON PIPE SIZES - OUTSIDE DIAMETER / DR 15.5, 17, 21, 26, 32.5

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

I.P.S. Data

- ASTM F714 Sizes 4" to 20"
- ASTM D3035 Sizes 1 /2" to 3"

All pipe is manufactured from select PE4710 resins unless requested otherwise at the time of quote. While PE4710 resins are used, these resins meet or exceed the pressure ratings and physical properties of PE3608/3408 resins.

		IPS DR -15.5 140psi			*IPS DR - 17 125 psi*			*IPS DR - 21 100 psi*			*IPS DR - 26 80 psi*			*IPS DR - 32.5 65psi*		
Pipe Size	Nom. OD	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)	Min. Wall	Avg. ID	Weight (lbs/ft.)
1/2"	0.840															
3/4"	1.050															
1"	1.315	0.085	1.13	0.144	0.077	1.15	0.132									
1-1/4"	1.660	0.107	1.43	0.229	0.098	1.45	0.21									
1-1/2"	1.900	0.123	1.64	0.30	0.112	1.66	0.276									
2"	2.375	0.153	2.05	0.469	0.140	2.07	0.431	0.113	2.13	0.35						
2-1/2"	2.875	0.185	2.48	0.69	0.169	2.51	0.631	0.137	2.58	0.52						
3"	3.500	0.226	3.02	1.02	0.206	3.06	0.935	0.167	3.14	0.767	0.135	3.21	0.63	0.108	3.27	0.50
4"	4.500	0.290	3.88	1.69	0.265	3.93	1.55	0.214	4.04	1.27	0.173	4.13	1.03	0.138	4.20	0.835
5"	5.563	0.359	4.80	2.58	0.327	4.86	2.36	0.265	5.00	1.94	0.214	5.10	1.58	0.171	5.20	1.28
6"	6.625	0.427	5.71	3.65	0.390	5.79	3.35	0.315	5.95	2.75	0.255	6.08	2.24	0.204	6.19	1.81
8"	8.625	0.556	7.44	6.19	0.507	7.54	5.68	0.411	7.75	4.66	0.332	7.92	3.80	0.265	8.06	3.07
10"	10.750	0.694	9.27	9.62	0.632	9.40	8.83	0.512	9.66	7.23	0.413	9.87	5.90	0.331	10.04	4.76
12"	12.750	0.823	11.00	13.53	0.750	11.16	12.41	0.607	11.46	10.18	0.490	11.71	8.30	0.392	11.91	6.70
14"	14.000	0.903	12.08	16.31	0.824	12.25	14.97	0.667	12.58	12.27	0.538	12.85	10.01	0.431	13.08	8.08
16"	16.000	1.032	13.81	21.30	0.941	14.00	19.55	0.762	14.38	16.03	0.615	14.69	13.08	0.492	14.95	10.55
18"	18.000	1.161	15.53	26.96	1.059	15.75	24.74	0.857	16.18	20.28	0.692	16.53	16.55	0.554	16.82	13.35
20”	20.000	1.29	17.26	32.82	1.176	17.50	30.58	0.952	17.98	25.07	0.769	18.37	20.45	.0615	18.69	16.50

O.D. controlled water/fluids pipe.
Recommended for municipal, industrial, and government applications. Easily connects by fusing, eliminating the need for common connections.

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MUNICIPAL • INDUSTRIAL HDPE PIPE

DUCTILE IRON PIPE SIZES

DUCTILE IRON PIPE SIZE - OUTSIDE DIAMETER / DR 7, DR 7.3, DR 9, DR 11

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

D.I.P.S. Data

- ASTM F714

All pipe is manufactured from select PE4710 resins unless requested otherwise at the time of quote. While PE4710 resins are used, these resins meet or exceed the pressure ratings and physical properties of PE3608/3408 resins.

		DIPS DR - 7 335 psi			*DIPS DR - 7.3 317 psi*			*DIPS DR - 9 250 psi*			*DIPS DR - 11 200 psi*		
Pipe Size	Nom. OD	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)
3"	3.96							0.44	3.02	2.13	0.36	3.19	1.78
4"	4.800	0.686	3.34	3.87	0.658	3.40	3.74	0.533	3.66	3.13	0.436	3.87	2.62
6"	6.900	0.986	4.81	7.99	0.945	4.89	7.72	0.767	5.27	6.46	0.627	5.57	5.42
8"	9.050	1.293	6.30	13.75	1.240	6.42	13.28	1.006	6.91	11.12	0.823	7.30	9.32
10"	11.100	1.586	7.738	20.70	1.521	7.876	19.81	1.233	8.48	16.72	1.009	8.96	14.01
12"	13.200	1.886	9.202	29.27	1.808	9.367	28.00	1.467	10.09	23.65	1.200	10.65	19.82
14"	15.300	2.186	10.66	39.33	2.096	10.85	37.63	1.700	11.69	31.80	1.391	12.35	26.63
16"	17.400	2.486	12.13	50.87	2.384	12.34	48.67	1.933	13.30	41.13	1.582	14.04	34.44
18"	19.500	2.786	13.59	63.89	2.671	13.83	61.12	2.167	14.90	51.66	1.773	15.74	43.29

O.D. controlled water/fluids pipe.
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MUNICIPAL • INDUSTRIAL HDPE PIPE

DUCTILE IRON PIPE SIZES

DUCTILE IRON PIPE SIZE - OUTSIDE DIAMETER / DR 13.5, DR 17, DR 21, DR 26

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

D.I.P.S. Data

- ASTM F714

All pipe is manufactured from select PE4710 resins unless requested otherwise at the time of quote. While PE4710 resins are used, these resins meet or exceed the pressure ratings and physical properties of PE3608/3408 resins.

		DIPS DR - 13.5 160 psi			***DIPS DR - 17 125 psi***			***DIPS DR - 21 100 psi***			***DIPS DR - 26 80 psi***		
Pipe Size	Nom. OD	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)	Min. Wall	Avg. ID	Weight (lbs/ft)
3"	3.96	0.293	3.33	1.48	0.233	3.46	1.20	0.189	3.55	0.982			
4"	4.800	0.356	4.04	2.18	0.282	4.20	1.76	0.229	4.31	1.44	0.185	4.40	1.18
6"	6.900	0.511	5.81	4.50	0.406	6.03	3.64	0.329	6.20	2.98	0.265	6.33	2.43
8"	9.050	0.670	7.62	7.74	0.532	7.92	6.25	0.431	8.13	5.13	0.348	8.31	4.18
10"	11.100	0.822	9.35	11.64	0.653	9.71	9.41	0.529	9.97	7.71	0.427	10.19	6.29
12"	13.200	0.978	11.12	16.47	0.776	11.55	13.31	0.629	11.86	10.91	0.508	12.12	8.90
14"	15.300	1.133	12.89	22.12	0.900	13.39	17.88	0.729	13.75	14.66	0.588	14.05	11.96
16"	17.400	1.289	14.66	28.61	1.024	15.23	23.12	0.829	15.64	18.95	0.669	15.98	15.46
18"	19.500	1.444	16.43	35.97	1.147	17.06	29.07	0.929	17.53	23.84	0.750	17.91	19.44

O.D. controlled water/fluids pipe.
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Flying W Plastics & PPI

Flying W Plastics, Inc. is a member in good standing with the Plastics Pipe Institute (PPI). PPI is the major trade association representing all segments of the plastics piping industry. As an association, PPI focuses collaborative efforts to accumulate data, concentrate facts, and target resources toward advancements in plastics piping application and usage. PPI promotes contemporary use of plastics piping for water and gas distribution,sewer and wastewater, oil and gas production, industrial and mining uses, power and communications, and ducting and irrigation.

PPI's vision and leadership have resulted in the establishment of uniform testing and design criteria that has become the foundation for all current applications of plastics piping. As PPI members, Flying W Plastics recommends PPI's Handbook of Polyethylene Pipe, Second Edition for testing and design criteria of all HDPE pipe manufactured by Flying W Plastics. This handbook is available for purchase online (www.plastipipe.org). The individual chapters can be downloaded free of charge (www.plasticpipe.org/publications/pe_handbook.html).
Many case studies, technical bulletins, and pipe calculations can also be found at the PPI web site.

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YOUR CONDUIT
CONNECTION
Flying W Plastics, Inc.

High-Density Polyethylene Utility Service Conduit

PRODUCT SPECIFICATIONS

Electrical Duct • Telephone Duct
Television Cable Duct

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YOUR CONDUIT CONNECTION
Flying W Plastics, Inc.

OVERVIEW

Flying W Plastics manufactures Utility Service Conduit from High-Density Polyethylene in accordance with the specifications of ASTM F-2160 and/or NEMA TC 7. Other dimensional requirements may be acceptable upon request.

Utility Service Conduit offers excellent characteristics that make it ideal for conduit, including:

- *High strength to endure heavy external loads.*
- *Its flexibility, toughness, lightness and impact-resistance help lower installation cost.*
- *Resists corrosive chemicals and aggressive soils.*
- *Long-term strength for increased life and performance.*
- *Moisture-proof and water-tight.*
- *Coils provide for fewer joints and lower installation costs.*
- *Does not support biological growth.*
- *Available in several colors or stripes.*
- *Can be manufactured with pre-installed pull tape in various tensile strengths.*

To decrease costly shoring and hazardous working conditions, the duct can be assembled above the ditch, plowed in, buried in open ditches or pulled through existing conduit.

Utility Service Conduit shall be joined by either heat-fusion or mechanical fittings. Flying W Plastics offers Utility Service Conduit in various sizes and wall thickness, some of which are covered in the charts on the following pages. The duct may be ordered in continuous coils, with or without steel reels, or produced in straight lengths up to 50 feet.

Flying W Plastics stocks a vast supply of Utility Service Conduit to meet most applications. Special orders are also accepted, with one of the quickest turn-arounds in the business. We have our own truck fleet and ship anywhere in the continental United States. Less-than-truckload orders are shipped on common carriers thatoffer cost-effective and timely service. Hot Shot services for quick delivery needs are also available.

The physical properties of Utility Service Conduit are covered on page 6. For more information, contact us for a distributor in your area, or visit us on the web at **flyingwplastics.com**.

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for quality polyethylene pipe products, service & logistics

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YOUR CONDUIT CONNECTION
Flying W Plastics, Inc.

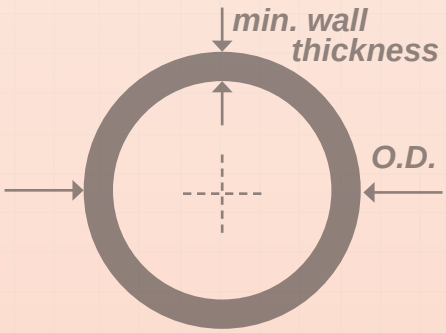
PRODUCT SPECS

Reeled/Coiled HDPE Utility Service Conduit

The following table represents the specifications of ASTM F-2160 and NEMA TC-7 for O.D. controlled conduit sizes 1"-6" that are available in reels or coils.

Sizes	Wall Thickness	Nominal O.D.	Nominal I.D.	Minimum in. Wall	Nominal lbs/ft	Standard Coil/Reel Lengths	Standard Truck	Steel Reel Size FxTxD*
1"	DR 9	1.315"	1.00"	.146"	0.23	500'	117000'	Coils
	DR 11	1.315"	1.07"	.120"	0.20	5000'	80000'	70x38x30
	DR 13.5	1.315"	1.12"	.097"	0.17	8000'	96000'	84x43x36
1 ¼"	DR 9	1.660"	1.26"	.184"	0.37	500'	78000'	Coils
	DR 11	1.660"	1.34"	.151"	0.31	2000'	32000'	70x28x30
	DR 13.5	1.660"	1.39"	.123"	0.26	5000'	70000'	84x42X36
	DR 15.5	1.660"	1.44"	.107"	0.23	8000'	96000'	96x45x36
1 ½"	DR 9	1.900"	1.45"	.211"	0.49	500'	36000'	Coils
	DR 11	1.900"	1.53"	.173"	0.41	4000'	56000'	84x42x36
	DR 13.5	1.900"	1.60"	.141"	0.34	6000'	72000'	96x45x36
2"	DR 9	2.375"	1.81"	.264"	0.76	500'	24500'	Coils
	DR 11	2.375"	1.91"	.216"	0.64	1000'	18000'	70x42x36
	DR 13.5	2.375"	2.00"	.176"	0.53	2500'	35000'	84x42x36
	DR 15.5	2.375"	2.04"	.153"	0.47	3000'	36000'	96x38x36
	DR 17	2.375"	2.07"	.140"	0.43	4000'	48000'	96x45x36
2 ½"	DR 11	2.875"	2.32"	.261"	0.94	1500'	18000'	96x38x55
	DR 13.5	2.875"	2.42"	.213"	0.78			
3"	DR 11	3.500"	2.86"	.318"	1.39	500'	12000'	Coils
	DR 13.5	3.500"	2.98"	.259"	1.15	1000'	12000'	96x45x70
	DR 15.5	3.500"	3.04"	.226"	1.02	1250'	15000'	96x45x55
4"	DR 9	4.500"	3.50"	.500"	2.77	500'	6000'	Coils
	DR 11	4.500"	3.68"	.409"	2.29	550'	6600'	96x45x70
	DR 13.5	4.500"	3.83"	.333"	1.90	750'	9000'	102x45x70
	DR 15.5	4.500"	3.92"	.290"	1.68			
5"	DR 11	5.563"	4.55"	.506"	3.50	500'	4000'	114x45x80
	DR 13.5	5.563"	4.73"	.412"	2.91	500'		
6" **	DR 11	6.625"	5.42"	.602"	4.97	450'	3600'	120x45x84
	DR 13.5	6.625"	5.64"	.491"	4.13	450'		

** Flange x Internal Traverse x Drum (in inches)*
*** Coiled duct truckloads may require special state permits*
Other reel and coil sizes are available upon request



DR = O.D. / min. wall thickness

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YOUR CONDUIT CONNECTION
Flying W Plastics, Inc.

PRODUCT SPECS

I.D. Controlled (IDR) HDPE Utility Service Conduit

The following table represents the dimensional specifications of ASTM D-2239, and ASTM F-2160 for I.D.

Sizes	Wall Thickness	Nominal O.D.	Nominal I.D.	Minimum in. Wall	Nominal lbs/ft	Standard Coil Reel Lengths	Standard Truck	Steel Reel Size FxTxD*
1"	IDR 11.5 IDR 15	1.231" 1.189"	1.049" 1.049"	.091" .070"	0.15 0.11	5000' 8000'	80000' 96000'	70x38x30 84x43x36
1 ¼"	IDR 9 IDR 11.5	1.690" 1.627"	1.380" 1.380"	.153" .120"	0.33 0.25	5000' 8000'	70000' 96000'	84x42X36 96x43x30
1 ½"	IDR 11.5 IDR 15	1.890" 1.825"	1.610" 1.610"	.140" .107"	0.34 0.26	4000' 6000'	56000' 72000'	84x42x36 96x45x36
2"	IDR 11.5	2.427"	2.067"	.180"	0.56	2500'	35000'	84x42x36
4"	IDR 11.5	4.750"	4.026"	.350"	2.12	500' 700'	6000' 8400'	96x45x70 102x45x70

** Flange x Internal Traverse x Drum (in inches)*

Ribbed HDPE Utility Service Conduit

Our Ribbed HDPE Utility Service Conduit is manufactured to specifications of ASTM F2160. It has a lower coefficient of friction when compared to smooth duct, and is available in a wide variety of colors, stripes and sizes.

Sizes	Wall Thickness	Nominal O.D.	Nominal I.D.	Minimum in. Wall	Nominal lbs/ft	Standard Coil Reel Lengths	Standard Truck	Steel Reel Size FxTxD*
1"	DR 13.5	1.315"	1.11"	.097"	.17	5000'	80000'	70x38x30
1 ¼"	DR 13.5	1.660"	1.41"	.123"	.26	5000'	70000'	84x42x36
1 ½"	DR 13.5	1.900"	1.61"	.141"	.34	4000'	56000'	84x42x36
2"	DR 13.5	2.375"	2.02"	.176"	.53	2500'	35000'	84x42x36
3"	DR 13.5	3.500"	2.97"	.259"	1.15	1000'	12000'	96x38x55
4"	DR 13.5	4.500"	3.82"	.333"	1.90	550'	6600'	96x45x70

NOTE: also available in DR 9 & DR 11

** Flange x Internal Traverse x Drum (in inches)*

HDPE Larger-Diameter Conduit

Larger-diameter conduit is available in 20-, 40- and 50-foot lengths in DR 9, 11, 13.5 and 17. These products meet ASTM F 2160 specifications.

		DR 9			DR 11			DR 13.5			DR 17		
Sizes	Nom. O.D.	Min. Wall	Avg. I.D.	Weight (lbs/ft)	Min. Wall	Avg I.D.	Weight (lbs/ft)	Min. Wall	Avg. I.D.	Weight (lbs/ft)	Min. Wall	Avg I.D.	Weight (lbs/ft)
4"	4.500	0.500	3.44	2.74	0.409	3.63	2.29	0.333	3.79	1.91	0.265	3.93	1.54
5"	5.563	0.618	4.25	4.18	0.506	4.49	3.51	0.412	4.68	2.91	0.327	4.86	2.35
6"	6.625	0.736	5.06	5.93	0.602	5.34	4.97	0.491	5.58	4.13	0.390	5.79	3.34
8"	8.625	0.958	6.59	10.05	0.784	6.96	8.43	0.639	7.27	7.00	0.507	7.54	5.66
10"	10.750	1.194	8.21	15.62	0.977	8.67	13.09	0.796	9.06	10.88	0.632	9.40	8.79
12"	12.750	1.417	9.74	21.97	1.159	10.29	18.41	0.944	10.74	15.30	0.750	11.16	12.36
14"	14.000	1.556	10.70	26.49	1.273	11.30	22.20	1.037	11.80	18.45	0.824	12.25	14.90
16"	16.00	1.778	12.23	34.60	1.455	12.91	28.99	1.185	13.48	24.09	0.941	14.00	19.49
18"	18.00	2.000	13.76	43.79	1.636	14.53	36.70	1.333	15.17	30.49	1.059	15.75	24.64

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YOUR CONDUIT CONNECTION
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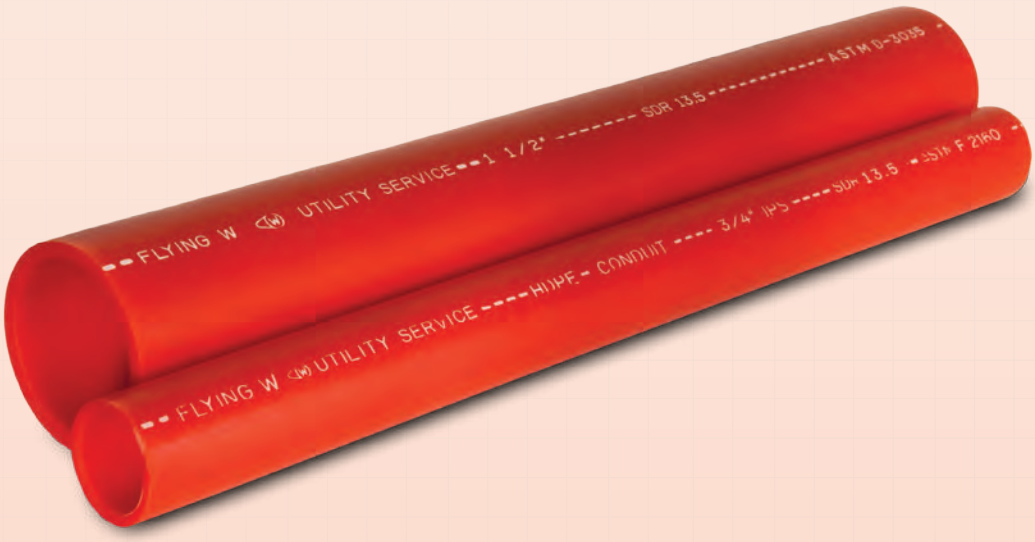
PRODUCT SPECS

Schedule 40 & Schedule 80 HDPE Conduit

The following table represents the specifications of ASTM F-2160 for O.D. controlled.

Sizes	Wall Thickness	Nominal O.D.	Nominal I.D.	Minimum in. Wall	Nominal lbs/ft	Standard Coil Reel Lengths	Standard Truck	Steel Reel Size FxTxD*
1"	SCH 40 SCH 80	1.315" 1.315"	1.04" 0.95"	.133" .179"	0.22 0.28	5000' 8000'	80000' 96000'	70x38x30 84x43x36
1 ¼"	SCH 40 SCH 80	1.660" 1.660"	1.38" 1.27"	.140" .191"	0.29 0.39	5000' 8000'	70000' 96000'	84x42X36 96x43x30
1 ½"	SCH 40 SCH 80	1.900" 1.900"	1.61" 1.50"	.145" .200"	0.35 0.47	4000' 6000'	56000' 72000'	84x42x36 96x45x36
2"	SCH 40 SCH 80	2.375" 2.375"	2.06" 1.93"	.154" .218"	0.47 0.64	2500' 4000'	35000' 48000'	84x42x36 96x45x36
2 ½"	SCH 40 SCH 80	2.875" 2.875"	2.46" 2.32"	.203" .276"	0.75 0.99	1500'	18000'	96x38x55
3"	SCH 40 SCH 80	3.500" 3.500"	3.06" 2.90"	.216" .300"	0.98 1.32	1000' 1250'	12000' 15000'	96x38x55 96x45x55
4"	SCH 40 SCH 80	4.500" 4.500"	4.02" 3.82"	.237" .337"	1.39 1.92	20' & 40' 550'	16240' 6600'	Sticks Only 96x45x70
5"	SCH 40 SCH 80	5.563" 5.563"	5.04" 4.81"	.258" .375"	1.89 2.69	20' & 40'	12160'	Sticks Only
6"	SCH 40 SCH 80	6.625" 6.625"	6.03" 5.70"	.280" .432"	2.44 3.67	20' & 40'	7280'	Sticks Only
8"	SCH 40	8.625"	7.94"	.322"	3.68	40' & 50'	4480'	Sticks Only
10"	SCH 40	10.75"	9.97"	.365"	5.21	40' & 50'	2880'	Sticks Only
12"	SCH 40	12.75"	11.89"	.406"	6.90	40' & 50'	2240'	Sticks Only

** Flange x Internal Traverse x Drum (in inches)*
Other reel and coil sizes available upon request. Contact us for more information.



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YOUR CONDUIT CONNECTION
Flying W Plastics, Inc.

PRODUCT SPECS

ELT Listed to UL 651A HDPE Electrical Conduit

Manufactured to specifications of ASTM F2160 and NEMA TC-7. Available in 1-6" sizes and in SCH 40, SCH 80 and DR 13.5 (EPEC-B).

Sizes	Wall Thickness	Nominal O.D.	Nominal I.D.	Minimum in. Wall	Nominal lbs/ft	Standard Coil Reel Lengths	Standard Truck	Steel Reel Size FxTxD*
1"	SCH 40 SCH 80 DR 13.5	1.315" 1.315" 1.315"	1.04" 0.95" 1.12"	.133" .179" .097"	0.22 0.28 0.17	5000' 8000' 8000'	80000' 96000' 96000'	70x38x30 84x43x36 84x43x36
1 ¼"	SCH 40 SCH 80 DR 13.5	1.660" 1.660" 1.660"	1.38" 1.27" 1.39"	.140" .191" .123"	0.29 0.39 0.26	5000' 8000' 5000'	70000' 96000' 70000'	84x42X36 96x43x30 84x42X36
1 ½"	SCH 40 SCH 80 DR 13.5	1.900" 1.900" 1.900"	1.61" 1.50" 1.60"	.145" .200" .141"	0.35 0.47 0.34	4000' 6000' 6000'	56000' 72000' 72000'	84x42x36 96x45x36 96x45x36
2"	SCH 40 SCH 80 DR 13.5	2.375" 2.375" 2.375"	2.06" 1.93" 2.00"	.154" .218" .176"	0.47 0.64 0.53	2500' 4000' 2500'	35000' 48000' 35000'	84x42x36 96x45x36 84x42x36
2 ½"	SCH 40 SCH 80 DR 13.5	2.875" 2.875" 2.875"	2.46" 2.32" 2.42"	.203" .276" .213"	0.75 0.99 0.78	1500'	18000'	96x38x55
3"	SCH 40 SCH 80 DR 13.5	3.500" 3.500" 3.500"	3.06" 2.90" 2.98"	.216" .300" .259"	0.98 1.32 1.15	1000' 1250' 1000'	12000' 15000' 12000'	96x38x55 96x45x55 96x45x70
4"	SCH 40 SCH 80 DR 13.5	4.500" 4.500" 4.500"	4.02" 3.82" 3.83"	.237" .337" .333"	1.39 1.92 1.90	20' & 40' 550' 550'	16240' 6600' 6600'	Sticks Only 96x45x70 96x45x70
5"	SCH 40 SCH 80 DR 13.5	5.563" 5.563" 5.563"	5.04" 4.81" 4.73"	.258" .375" .412"	1.89 2.69 2.91	20' & 40' 20' & 40' 500'	12160' 12160' 4000'	Sticks Only Sticks Only 114x45x80
6" **	SCH 40 SCH 80 DR 13.5	6.625" 6.625" 6.625"	6.03" 5.70" 5.64"	.280" .432" .491"	2.44 3.67 4.13	20' & 40' 20' & 40' 450'	7280' 7280' 3600'	Sticks Only Sticks Only 120x45x84

** Flange x Internal Traverse x Drum (in inches)*
*** Coiled duct truckloads may require special state permits*
Other reel and coil sizes are available upon request

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YOUR CONDUIT CONNECTION
Flying W Plastics, Inc.

PROPERTIES & TECHNICAL INFO

Utility Service Conduit

Flying W Plastics certifies the above product to be manufactured from select high-density polyethylene copolymers (see typical properties below) and meet specifications set forth in ASTM D-3350, ASTM F-2160, and NEMA TC-7. The high-density polyethylene copolymers are selected specifically for use in telecommunications, electrical/power or telephone ducting applications, while keeping in mind the required properties to balance stiffness, ESCR and molecular weight to provide toughness and crush strength.

Typical Properties (1)	English	SI Units	ASTM Method
Density	-	0.948 g/cc	D 4883
Melt Index[2]	-	0.22 g/10 min	D 1238
Tensile Strength			
@ Yield (2 in/min)	3400 psi	23.4 MPa	D 638
@ Break (2 in/min)	4500 psi	31.0 MPa	D 638
Elongation @ Break (2 in/min)	>800%	>800%	D 638
Flexural Modulus[3]	130,000 psi	897 MPa	D 790
Hardness (Shore D)	68	68	D 2240
Deflection Temperature @ 66 psi	156 °F	69 °C	D 648
Brittleness Temperature	<-180 °F	<-118 °C	D 746
OIT @ 200 °C	>20 min.	>20 min.	D3895 Modified[4]
Environmental Stress Crack Residtance[5]	>96 hrs	>96 hrs	D 1693
Environmental Stress Crack Resistance[6]	>192 hrs	>192 hrs	D 1693
Cell Classification	*335430E	*335430E	D 3350
* classification for colored conduit † classification for black conduit (with a minimum of 2% carbon black)	†335430C	†335430C	D 3350
UV Protection	Minimum 1 year outside storage on colors; black is manufactured with Carbon Black for added UV protection and additional storage life		

(1) Typical properties will vary within specification limits
(2) 190 °C / 2160g
(3) 2% Secant-Method 1
(4) Excludes Copper Mesh
(5) Condition B, 10% Igepal, F10
(6) Condition C, 100% Igepal, F20

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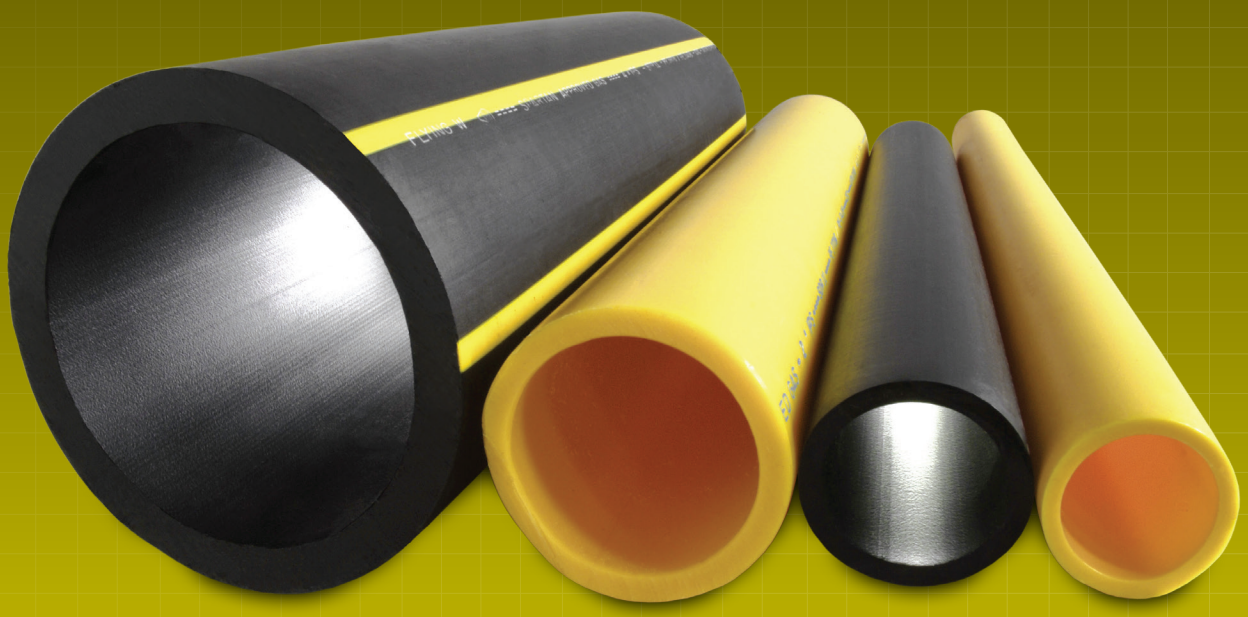
TITAN II & SUPREME

POLYETHYLENE GAS PIPE

Titan II™ & Supreme™ Medium- & High-Density Polyethylene Pipe

PRODUCT SPECIFICATIONS



Premium Polyethylene Gas & Oil Patch Pipe

FLYING W PLASTICS, INC.

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TITAN & SUPREME
POLYETHYLENE GAS PIPE

OVERVIEW

Flying W Plastics manufactures polyethylene gas pipe for **gas gathering** and **oil patch** applications in accordance with the specifications set forth in ASTM D 2513. We carry a complete line of both PE2708 (2406) Medium-Density Yellow Gas Pipe [**1**]and PE4710 (3408) High-Density Black Gas Pipe [**2**]. Both come with a 25-Year Warranty (see Warranty Statement for details) and are available in various diameter sizes and lengths.

1

for natural gas distribution and service lines

2

for natural gas gathering and oil patch applications

Your **EXPERT SOURCE**
for quality polyethylene pipe products, service & logistics

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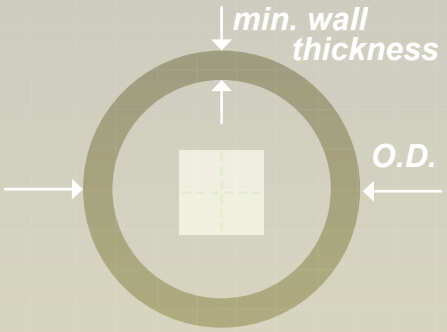
TITAN & SUPREME
POLYETHYLENE GAS PIPE

SUPREME BLACK GAS PIPE SIZE AVAILABILITY

PE4710 (3408) HDPE black gas pipe

DR 11.0

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)	Weight lbs/ft
1/2"	0.840	0.076	0.67	0.08
3/4"	1.050	0.095	0.84	0.125
1"	1.315	0.120	1.06	0.197
1-1/4"	1.660	0.151	1.34	0.313
1-1/2"	1.900	0.173	1.53	0.411
2"	2.375	0.216	1.91	0.642
2-1/2"	2.875	0.261	2.32	0.94
3"	3.500	0.318	2.82	1.39
4"	4.500	0.409	3.63	2.30
5"	5.563	0.506	4.49	3.52
6"	6.625	0.602	5.34	4.99
8"	8.625	0.784	6.96	8.46
10"	10.750	0.977	8.67	13.14
12"	12.750	1.159	10.29	18.49
14"	14.000	1.273	11.30	22.29
16"	16.000	1.455	12.91	29.12
18"	18.000	1.636	14.53	36.85



DR = O.D. / min. wall thickness

NOTE: *Pressure ratings can be application-specific. To determine maximum allowable pressure ratings, please check with any and all state, federal and local requirements that may govern your specific application. Pressure calculations can be made using the PPI (Plastic Pipe Institute) formula outlined in PPI TR-4 while taking the above considerations into account. More information can be found at* **www.plasticpipe.org**.

DR 9.0

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)	Weight lbs/ft
1/2"	0.840	0.093	0.64	0.096
3/4"	1.050	0.117	0.80	0.15
1"	1.315	0.146	1.00	0.235
1-1/4"	1.660	0.184	1.26	0.374
1-1/2"	1.900	0.211	1.45	0.49
2"	2.375	0.264	1.81	0.766
2-1/2"	2.875	0.319	2.19	1.12
3"	3.500	0.389	2.67	1.66
4"	4.500	0.500	3.44	2.75
5"	5.563	0.618	4.25	4.20
6"	6.625	0.736	5.06	5.96
8"	8.625	0.958	6.59	10.10
10"	10.750	1.194	8.21	15.68
12"	12.750	1.417	9.74	22.06
14"	14.000	1.556	10.70	26.60
16"	16.000	1.778	12.23	34.74
18"	18.000	2.000	13.76	43.97

DR 7.3

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)	Weight lbs/ft
1/2"	0.840	0.115	0.59	0.114
3/4"	1.050	0.144	0.74	0.18
1"	1.315	0.180	0.93	0.28
1-1/4"	1.660	0.227	1.17	0.447
1-1/2"	1.900	0.260	1.34	0.585
2"	2.375	0.325	1.68	0.914
2-1/2"	2.875	0.394	2.04	1.34
3"	3.500	0.479	2.48	1.99
4"	4.500	0.616	3.19	3.28
5"	5.563	0.762	3.94	5.02
6"	6.625	0.908	4.70	7.12
8"	8.625	1.182	6.12	12.06
10"	10.750	1.473	7.62	18.74
12"	12.750	1.747	9.04	26.36

Other sizes and dimensions available upon request.

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TITAN & SUPREME
POLYETHYLENE GAS PIPE

PE4710
PRODUCT SPECS

PE4710 (3408) HDPE black gas pipe

Flying W Plastics certifies this product to be manufactured from PE4710 (3408) high-density polyethylene copolymer (see properties below) and meet specifications set forth in ASTM D-2513 (Standard Specification for Thermoplastics Gas Pressure Pipe, Tubing, and Fittings). These polyethylene copolymers are designed specifically for pipe extrusion and are listed with the Plastic Pipe Institute (PPI). They exhibit excellent long-term stress life and environmental stress crack resistance. This material is certified to CSA Standard B 137.4-99 and is recognized by the Plastics Pipe Institute as having a PE4710 (3408) and PE 100 rating.

Typical Properties[1]	English Values	SI Units	ASTM Method
Density (Black)	-	0.959 g/cc	D 4883
Melt Index[2]	-	8.0 g/10 min	D 1238
Tensile Strength @ Yield (2 in/min) Tensile Strength @ Break (2 in/min)	3625 psi 5500 psi	25.0 MPa 38.0 Mpa	D 638 D 638
Elongation @ Break (2 in/min)	>600%	>600%	D 638
Flexural Modulus[3]	150,000 psi	1.035 Mpa	D 790
Notched Izod Impact Strength	9 ft-lbf/in	0.49 kj/m	D 256
Hardness (Shore D)	66	66	D 2240
Vicat Softening Point	259 °F	126 °C	D 1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis @ 23 °C Hydrostatic Design Basis @ 60 °C	1600 psi 1000 psi	11.0 Mpa 6.9 Mpa	D 2837 D 2837
Minimum Required Strength	-	100 Mpa	ISO 9080
Environmental Stress Crack Resistance[4]	>5000 hrs	>5000 hrs	D 1693
Notch Tensile (PENT)	>5,000 hrs	>5,000 hr	F 1473
Carbon Black Concentration	2.3%	2.3%	D 1603
Cell Classification	445574C	445574C	D 3350

[1]Typical properties will vary within specification limits
[2]190 °C / 21600g
[3]2% Secant-Method 1
[4]Condition C

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THIS PRODUCT HAS BEEN DISCONTINUED

TITAN & SUPREME
POLYETHYLENE GAS PIPE

PE2708
PRODUCT SPECS

PE2708 (2406) MDPE yellow gas pipe

Flying W Plastics certifies the above product of be manufactured from PE2708 (2406) Yellow Medium density polyethylene copolymer (see properties below) and meet specifications set forth in ASTM D-2513 (Standard Specification for Thermoplastics Gas Pressure Pipe, Tubing, and Fittings). These polyethylene copolymers are designed specifically for pipe extrusion and are listed with the Plastic Pipe Institute (PPI). They exhibit excellent long term stress life and environmental stress crack resistance. This material is certified to CSA Standard B 137.4-02 and is recognized by the Plastics Pipe Institute as having a PE2708 (2406) and PE 80 rating.

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Typical Properties[1]	English Values	SI Values	ASTM Method
Density (Yellow)	-	0.943 g/cc	D 4883
Melt Index[2]	-	0.20 g/10 min	D 1238
Tensile Strength @ Yield (2 in/min) @ Break (2 in/min)	2800 psi 4500 psi	19.3 MPa 31.0 MPa	D 638 D 638
Elongation @ Break (2 in/min)	>800%	>800%	D 638
Flexural Modulus[3]	100,000 psi	690 MPa	D 790
Notched Izod Impact Strength	10 ft-lbf/in	0.53 kj/m	D 256
Hardness (Shore D)	64	64	D 2240
Vicat Softening Point	248 °F	120 °C	D 1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis @ 23 °C @ 60 °C	1250 psi 1000 psi	8.6 MPa 6.9 MPa	D 2837 D 2837
Minimum Required Strength	-	8.0 MPa	ISO 9080
Environmental Stress Crack Resistance[4]	>5000 hrs	>5000 hrs	D 1693
Environmental Stress Crack Resistance[5]	>5000 hrs	>5000 hrs	D 1693
Pipe Ring ESCR[6]	>5000 hrs	>5000 hrs	F 1248
Notch Tensile (PENT)	>500 hrs	>500 hrs	F 1473
Thermal Stability	428 °F Min.	220 °C Min.	D 2513 / D 3350
Cell Classification	234373E	234373E	D 3350

[1]Typical properties will vary within specification limits
[2]190 °C / 2160g
[3]2% Secant-Method 1
[4]Condition B, 10%
[5]Condition C
[6]One inch, IDR 7

** THIS PRODUCT HAS BEEN DISCONTINUED **

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**THIS PRODUCT HAS BEEN DISCONTINUED **

TITAN & SUPREME
POLYETHYLENE GAS PIPE

TITAN II YELLOW GAS PIPE SIZE AVAILABILITY

PE2708 (2406) MDPE yellow gas pipe

Approvals for MDPE gas pipe vary from region to region, and can be gas company-specific. Please check your local requirements to be certain our pipe is approved in your area. For maximum working pressure, check API recommendations, Federal D.O.T. requirements and/or other required standards for your specific application.

I.P.S. (Iron Pipe Sizes)

Nominal Pipe Size	Part Number	Nominal OD	Wall Thickness	Nominal Weight (per ft.)	Coil/Joint Length	List Price (per 100 ft.)
½" (DR 9.3)	G4411 G4415	0.840"	0.090"	.10#	150' 500'	CALL
¾" (DR 11)	G4421 G4425	1.050"	0.095"	.13#	150' 500'	CALL
1" (DR 11)	G4431 G4433 G4435	1.315"	0.119"	.20#	150' 300' 500'	CALL
1 ¼" (DR 11)	G4441 G4443 G4445	1.660"	0.151"	.31#	150' 300' 500'	CALL
1 ¼" (DR 10)	G4441-10 G4445-10	1.660"	0.166"	.34#	150' 500'	CALL
1 ½" (DR 11)	G4451 G4455	1.900"	0.173"	.41#	150' 500'	CALL
2" (DR 11)	G4461 G4465	2.375"	0.216"	.64#	150' 500'	CALL

Other coil lengths may be available upon request, and may require additional run times. Sizes 3" and larger are priced upon request and are subject to minimum run quantities.

THIS PRODUCT HAS BEEN DISCONTINUED

C.T.S. (Copper Tube Size)

Nominal Pipe Size	Part Number	Nominal OD	Wall Thickness	Nominal Weight (per ft.)	Coil/Joint Length	List Price (per 100 ft.)
1" (DR 11)	CT443100 CT4431 CT4435	1.125"	0.099"	.14#	100' 150' 500'	Calll

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TITAN & SUPREME
POLYETHYLENE GAS PIPE

25-YEAR LIMITED WARRANTY

Flying W Plastics warrants its Titan II and Supreme Gas pipe against rot, rust, material flaws, structural weaknesses and electrolytic corrosion and warrants it to be free from defect in materials and workmanship for a period of twenty-five (25) years from date of purchase by and to the original purchaser only. Flying W Plastics expressly limits its responsibility under this Limited Warranty to the following:

Flying W Plastics Inc., will provide an equivalent amount of plastic pipe of like size and grade to that amount which it acknowledges to be defective, to the original installer only.

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A sample measuring a minimum of twenty-four inches (24") in length, bearing the Flying W Plastics trademark, for any segment of pipe alleged by the original purchaser only to be defective, must be submitted to Flying W Plastics for inspection and testing. Any plastic pipe of Flying W Plastics thereafter acknowledged to be defective shall be exchanged as aforesaid, and Flying W Plastics shall assume the reasonable costs of transportation thereof to the point of the original delivery.

Purchaser and/or installer assumes all risk and liability for loss, damages or injury to persons or property of buyer or other parties arising out of use or possession of materials and products of Flying W Plastics, Inc.

Exclusions:
There are no warranties which extend beyond the description on the face thereof. Flying W Plastics disclaims any express or implied warranties of merchantability and fitness for a particular purpose. Flying W Plastics shall not be liable for special, indirect, incidental or consequential damages related to a defect of the pipe.

For the warranty to be valid pipe must be installed in accordance with accepted and approved industry guidelines and procedures. (PPI, ASTM, API)

Warranty does not apply to any fusion joining process or any other method or device used to join the pipe.

Warranty does not apply to the design or installation of the system or any other component of the system.

There are no warranties which extend beyond the description on the face thereof.

FLYING W

PLASTICS, INC.

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EARTH SOURCE GEOTHERMAL

Earth Source Geothermal™
High-Density Polyethylene Pipe
PRODUCT SPECIFICATIONS

Residential & Commercial • Coil & Straight
Single- & Dual-Wrapped • Available Pre-Installed U-bends
NSF-GEO certified / IGSHPA compliant

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FWP-ESG 2.0

OVERVIEW

Geothermal is becoming the heating and cooling method of choice for residential and commercial buildings across the country, and for good reasons:

- *With the implementation of geothermal systems, the cost of heating and cooling a home or business significantly decreases. In fact, the use of a geothermal system results in more cost savings than the most efficient conventional forced-air systems.*

- *Since a geothermal system recycles renewable energy to sustain itself, geothermal systems are more environmentally friendly when compared to traditional heating/cooling systems.*

Geothermal piping is creating a noticeable impact on the polyethylene market, with usage continuing to expand as residential and commercial customers look to reduce their heating and cooling costs while enjoying the benefits of utilizing a renewable energy source. Flying W Plastics is at the forefront in supporting the geothermal industry with its premium line of Earth Source Geothermal pipe. Furthermore, NSF-GEO certification for our Earth Source Geothermal pipe helps us to meet the highest standard for polyethylene geothermal piping in the industry.

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GENERAL PRODUCT INFORMATION

Earth Source Geothermal 3/4", 1" and 1-1/4" DR 9 and DR 11 piping are available in Earth Source Loops with U-bends that are pressurized and feature crimped ends. All resin used is HDPE-PE3608/PE3408 or PE4710 resin listed in PPI TR4 with a Cell Classification per ASTM D 3350 of 345464C for PE3608 or 445576C for PE4710. The materials have a Hydrostatic Design Basis of 1600 psi @ 73.4 degrees F. All Flying W Plastics' Earth Source Geothermal products meet or exceed the specifications set forth by IGSHPA, and are listed by NSF under their NSF Geothermal program. All piping is made to ASTM D3035 or ASTM F714 depending on size, and have sequential footage markings every two feet.

Flying W Plastics recommends joining Earth Source geothermal pipe by heat fusion. Use fusion procedures published by PPI in TN 13-2001 or Flying W Plastics. Flying W Plastics recommends inspecting all piping and fittings for damage prior to installation and hydrostatic testing of the completed installation prior to placing in service. Flying W Plastics recommends following IGSHPS Guidelines for installation and design.

- Available IPS pipe sizes: 3/4" to 18"
- 3/4"- to 6" available in coils or reels
- 3/4" to 18" available in straight lengths
- Piping available in DR 7 to DR 32.5, depending on size

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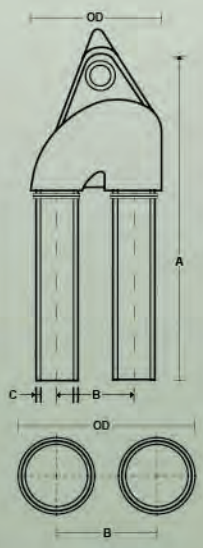
304.462.5779 ph • 800.327.4735 sales • 304.462.7657 fx

SPECIAL FEATURES AND AVAILABILITY

Dual-Wrapped Earth Source Geothermal Coils With Pre-Installed U-Bends

The fastest growing segment of Flying W Plastics' geothermal sales is for pre-fabricated dual-wrapped coils with a pre-installed U-bend. We fabricate the coils on-site using a DR 9 molded U-fitting.

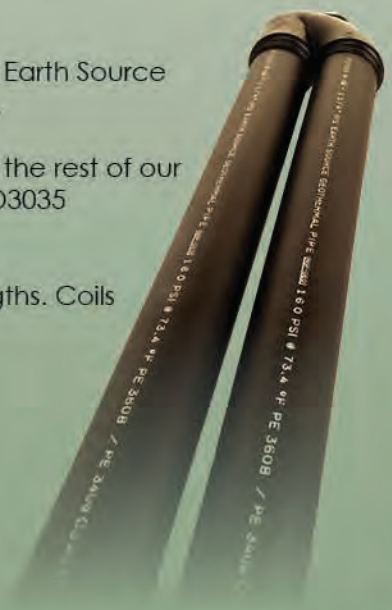
Our Earth Source Geothermal dual-wrapped coils are made from premium HDPE materials, having a cell classification of 345464C for PE3608/3408, or 445576C for PE4710 as per ASTM D3350.



The piping is made to ASTM D3035 specifications, and has NSF-Geothermal listing. The coils are butt-fused together to a one-piece U-bend by trained and certified employees. The fitting is specially designed for geothermal well applications with a tapered "spear pointed" head for ease of installation.

Once fabricated and coiled, the coils are pressurized and the ends are crimped to prevent contamination during installation, and to reduce the fear of integrity loss during the transportation, handling and well insertion phases of the installation.

Nominal Size	O.D.	"A" Length	"B" Center Space	"C" Min. Wall	"C" Max. Wall
3/4" IPS	3.09"	per customer	1.75"	.095"	.115"
1" IPS	3.12"	per customer	1.82"	.120"	.140"
1-1/4" IPS	3.83"	per customer	1.91"	.151"	.171"



Flying W Plastics is a member of the IGSHPA, and all of our Earth Source Geothermal products fully comply with IGSHPA guidelines.

We use the same high quality NSF-Geo certified pipe as in the rest of our geothermal product line. The coils are available to ASTM D3035 specifications in ¾",1", & 1¼", with DR 11 and DR 9 piping.

We stock DR 11 dual-wrapped coils in many sizes and lengths. Coils using DR 9 piping and custom lengths normally have fast turnaround on special orders.

Applications
Commercial, institutional, and residential wells and other installations where a complete loop with a U-bend is needed.

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EARTH SOURCE GEOTHERMAL

NORMALLY-STOCKED COILS

Flying W Plastics normally stocks both single-wrapped coils and dual-wrapped coils of our Earth Source Geothermal Pipe in a variety of sizes and lengths.

SINGLE-WRAPPED COILS

Single-wrapped coils are capped and banded to skids, then shrink-wrapped. Our ¾" through 1¼" pipe can be furnished with crimped ends and pressurized on request.

Size	Lengths Available
3/4" IPS	300', 400', 500', 600', 800'
1" IPS	300', 500'
1-1/4" IPS	150', 300', 500'
2" IPS	300', 500'

DUAL-WRAPPED COILS WITH U-BENDS

Dual-wrapped coils are fitted with a one-piece molded DR 9 U-bend, then crimped and pressurized. They are banded to pallets and shrink-wrapped.

Size	Total Coil Lengths Available
3/4" IPS	310', 410'
1" IPS	310', 410', 610'
1-1/4" IPS	610', 810', 1010'

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STANDARD DIMENSION RATIO AVAILABILITY

DR 9 250 PSI PE4710

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)*	Weight lbs/ft
3/4"	1.050	.117	0.80	.15
1"	1.315	.146	1.01	.235
1-1/4"	1.660	.184	1.27	.374
1-1/2"	1.900	.211	1.45	.49
2"	2.375	.264	1.82	.766
3"	3.500	.398	2.68	1.66
4"	4.500	.500	3.44	2.75
6"	6.625	.736	5.06	5.96
8"	8.625	.958	6.59	10.10
10"	10.750	1.194	8.22	15.68
12"	12.750	1.417	9.75	22.06
14"	14.00	1.556	10.70	26.60
16"	16.00	1.778	12.23	34.74
18"	18.00	2.000	13.76	43.97

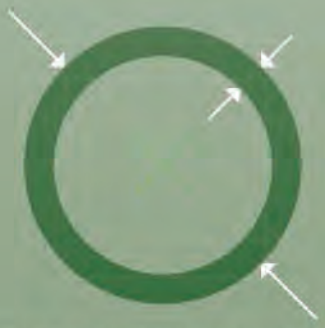
DR = O.D. / min. wall thickness

DR 11 200 PSI PE4710

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)*	Weight lbs/ft
3/4"	1.050	.095	0.85	.125
1"	1.315	.120	1.06	.197
1-1/4"	1.660	.151	1.34	.313
1-1/2"	1.900	.173	1.53	.411
2"	2.375	.216	1.92	.642
3"	3.500	.318	2.83	1.39
4"	4.500	.409	3.63	2.30
6"	6.625	.602	5.35	4.99
8"	8.625	.784	6.96	8.46
10"	10.750	.977	8.68	13.14
12"	12.750	1.159	10.29	18.49
14"	14.00	1.273	11.30	22.29
16"	16.00	1.455	12.91	29.12
18"	18.00	1.636	14.53	36.85

DR 15.5 138 PSI PE4710

IPS Pipe Size	Nominal OD	Min. Wall	Avg. ID (in.)*	Weight lbs/ft
3/4"	1.050	.068	0.91	.092
1"	1.315	.085	1.14	.144
1-1/4"	1.660	.107	1.43	.229
1-1/2"	1.900	.123	1.64	.30
2"	2.375	.153	2.05	.469
3"	3.500	.226	3.02	1.02
4"	4.500	.290	3.88	1.69
6"	6.625	.472	5.72	3.65
8"	8.625	.556	7.45	6.19
10"	10.750	.694	9.28	9.62
12"	12.750	.823	11.01	13.53
14"	14.00	.903	12.09	16.31
16"	16.00	1.032	13.81	21.30
18"	18.00	1.161	15.53	26.96



* Avg. I.D.'s are calculated using nominal O.D.'s and minimum wall thicknesses plus 6%.

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PE3608/3408 PRODUCT SPECS

Flying W Plastics certifies its Earth Source Geothermal Pipe to be manufactured from select PE3608/PE3408 high-density polyethylene copolymers (see typical properties below), and to meet specifications set forth in ASTM D-3035, ASTM D-3350 and ASTM F-714. This material meets all of the requirements of ASTM 1248-81A for type PE34 Class C Product. It has outstanding properties of a high hoop stress and a high level of environmental stress crack resistance.

Typical Properties[1]	English Values	SI Values	ASTM Method
Density (Black)	-	0.955 g/cc	D 4883
Melt Index[2]	-	8.75 g/10 min.	D 1238
Tensile Strength			
@ Yield (2 in/min)	3300 psi	22.8 MPa	D 638
@ Break (2 in/min)	4500 psi	31.0 MPa	D 638
Elongation @ Break (2 in/min)	>800%	>800%	D 638
Flexural Modulus[3]	120,000 psi	827 MPa	D 790
Notched Izod Impact Strength	6 ft-lbf/in	0.32 kj/m	D 256
Hardness (Shore D)	66	66	D 2240
Vicat Softening Point	259 °F	126 °C	D 1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis			
@ 23 °C	1600 psi	11.0 MPa	D 2837
@ 60 °C	800 psi	5.5 MPa	D 2837
Minimum Required Strength	-	8.0 MPa	ISO 9080
Environmental Stress Crack Resistance[4]	>2000 hrs	>2000 hrs	D 1693
Environmental Stress Crack Resistance[5]	>5000 hrs	>5000 hrs	D 1693
Pipe ring ESCR[6]	>5000 hrs	>5000 hrs	F 1248
Notch Tensile (PENT)	>100 hrs	>100 hrs	F 1473
Carbon Black Concentration	2.3%	2.3%	D 1603
Cell Classification	345464C	345464C	D 3350

[1]Typical properties will vary within specification limits
[2]190 degrees C/21,100g
[3]2% Secant-Method 1
[4]Condition B, 10%
[5]Condition C
[6]Two inch, IDR 19

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PE4710
PRODUCT SPECS

Flying W Plastics certifies its PE4710 Earth Source Geothermal Pipe to be manufactured from select PE4710/PE100 high-density polyethylene copolymers (see typical properties below), and to meet specifications set forth in ASTM D-3035, ASTM D-3350 and ASTM F-714. This material has NSF 14 and AWWA C901 certifications, complies with ANSI/NSF Standard 61 health requirements, and is recognized by the Plastics Pipe Institute as having a pipe material designation code of PE4710 and PE100.

Typical Properties[1]	English Values	SI Values	ASTM Method
Density (Black)	-	0.959 g/cc	D 4883
Melt Index[2]	-	8.0 g/10 min.	D 1238
Tensile Strength			
@ Yield (2 in/min)	3625 psi	25.0 MPa	D 638
@ Break (2 in/min)	5500 psi	38.0 Mpa	D 638
Elongation @ Break (2 in/min)	>600%	>600%	D 638
Flexural Modulus[3]	150,000 psi	1035 MPa	D 790
Notched Izod Impact Strength	9 ft-lbf/in	0.49 kj/m	D 256
Hardness (Shore D)	66	66	D 2240
Vicat Softening Point	259 °F	126 °C	D 1525
Brittleness Temperature	<-180 °F	<-118 °C	D 746
Hydrostatic Design Basis			
@ 23 °C	1600 psi	11.0 Mpa	D 2837
@ 60 °C	1000 psi	6.9 MPa	D 2837
Minimum Required Strength	-	100 MPa	ISO 9080
Environmental Stress Crack Resistance[4]	>5000 hrs	>5000 hrs	D 1693
Environmental Stress Crack Resistance[5]	>5000 hrs	>5000 hrs	D 1693
Pipe ring ESCR[6]	>5000 hrs	>5000 hrs	F 1248
Notch Tensile (PENT)	75,000 hrs	75,000 hrs	F 1473
Carbon Black Concentration	2.3%	2.3%	D 1603
Cell Classification	445574C	445574C	D 3350

[1]Typical properties will vary within specification limits
[2]190 degrees C/21,100g
[3]2% Secant-Method 1
[4]Condition B, 10%
[5]Condition C
[6]Two inch, IDR 19

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50-YEAR LIMITED WARRANTY

Flying W Plastics warrants its Earth Source Geothermal pipe against rot, rust, material flaws, structural weaknesses and electrolytic corrosion and warrants it to be free from defect in materials and workmanship for a period of fifty (50) years from date of purchase by and to the original installer only. Flying W Plastics expressly limits its responsibility under this Limited Warranty to the following:

Flying W Plastics Inc., will provide an equivalent amount of plastic pipe of like size and grade to that amount which it acknowledges to be defective, to the original installer only.

Flying W Plastics, Inc., will pay up to one dollar ($1.00) per lineal foot for labor charges actually incurred by the original installer in replacement of pipe warranted hereby, which pipe is acknowledged to be defective within five (5) years of the date of purchase by the original installer only, with a pro rata reduction of said amount thereafter for the remaining forty-five (45) years of this Limited Warranty.

A sample measuring a minimum of twenty-four inches (24") in length, bearing the Flying W Plastics trademark, for any segment of pipe alleged by the original purchaser only to be defective, must be submitted to Flying W Plastics for inspection and testing. Any plastic pipe of Flying W Plastics thereafter acknowledged to be defective shall be exchanged as aforesaid, and Flying W Plastics shall assume the reasonable costs of transportation thereof to the point of the original delivery.

Purchaser assumes all risk and liability for loss, damages or injury to persons or property of buyer or other parties arising out of use or possession of materials and products of Flying W Plastics, Inc.

Exclusions:

There are no warranties which extend beyond the description on the face thereof. Flying W Plastics disclaims any express or implied warranties of merchantability and fitness for a particular purpose. Flying W Plastics shall not be liable for special, indirect, incidental or consequential damages related to a defect of the pipe.

For the warranty to be valid pipe must be installed in accordance with accepted and approved industry guidelines and procedures. (PPI, ASTM, IGSHPA)

Warranty does not apply to any fusion joining process or any other method or device used to join the pipe.

Warranty does not apply to the design or installation of the system or any other component of the system.

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PRODUCT SUBMITTAL

PROJECT NAME_____

PROJECT LOCATION_____

CONTRACTOR_____

SCOPE: This Product Submittal is for Flying W Plastics Earth Source Geothermal Pipe and U-Bend Loops for Ground Source Heat Pump Systems.

MATERIALS: Flying W Plastics Earth Source Geothermal Pipe and Loops are manufactured from select virgin HDPE (high-density polyethylene) resins. These resins are listed with the Plastic Pipe Institute (PPI TR 4), are NSF 14 certified and comply with ANSI/NSF Standard 61. The resin cell classification per ASTM D-3350 is 345464C (for pipe marked PE3608/PE3408) and 445576C (for pipe marked PE4710). These materials have a Hydrostatic Design Basis of 1600 psi at 73 °F per ASTM D-2837. This material contains a minimum of 2% Carbon Black as a UV inhibitor to allow for pipe to be stored outside.

REFERENCE DOCUMENTS: Flying W Plastics Earth Source Geothermal Pipe is manufactured in accordance with ASTM D-3035 for pipe sizes ½" through 3" and ASTM F-714 for pipes 3" and larger.

CERTIFICATION: Flying W Plastics certifies that our Earth Source Geothermal Pipe and Loops meet the specifications and requirements identified herein. All Earth Source Geothermal Pipe and Loops are NSF-Geo certified.

WARRANTY: Flying W Plastics warrants its Earth Source Geothermal Pipe and Loops for a period of 50 years against rust, rot, electrolytic corrosion and defects in workmanship. This warranty is valid when the pipe and/or loops are utilized and installed in accordance with accepted and approved industry guidelines and practices. See warranty sheet for complete terms and conditions.

NOTES

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Flying W Plastics

Recommended Butt Fusion Procedure

The following is general instructions recommended by FWP and is not intended to replace or supersede the specific instructions furnished by fusion equipment manufacturer. FWP recommends an interfacial pressure of 75 psi +/- 10% and a heater plate temperature of 425° F +/- 25 degrees. It is necessary to consult the particular machine manufacturer's instructions regarding machine settings to achieve this condition. 75 PSI interfacial pressure IS NOT the hydraulic gauge pressure on the fusion machine. It is critical that the operator has a full understanding of the particular machine involved and should be trained by the fusion equipment manufacturer or his representative.

1. Load the pipe in the fusion machine. Insure the pipe ends are clean (utilize a clean, lint free cotton cloth if required). Make sure the clamps are properly tightened to avoid any pipe slippage through the fusion operation.

2. Face the ends of the pipe to the machine stops. After facing if there is any debris present it should be removed with a lint free cotton cloth. At this point, lack of contamination is critical. Make sure anything in contact with the pipe ends is free of contamination. Any cloth used must be free of contaminants, cleaning solvents, etc. Do not touch with bare hand as the oil from your skin can be a contaminant. Make sure your facer blades on the fusion equipment are free of contaminants. A residue free material like isopropyl alcohol can be used to clean equipment facer blades if necessary.

3. Check for high/low alignment. Misalignment should not exceed 10% of the wall thickness. If misalignment exist clamps can be readjusted, pipe rotated, etc. Re-face pipe as required.

Continued…….

4. Check the heater plate temperature. (425° F +/- 25 deg.) Allowance may be made for extreme conditions. (Example: a sub-zero condition would benefit from heater plate temperature on the high side of the range)

5. Insert the heater plate between the ends of the pipe and bring ends firmly in contact with the ends of the pipe. Fusion pressure is not applied at this point. Apply only enough pressure to ensure full contact with the ends of the pipe and watch for the proper melt bead.

   Approximate Melt Bead Size / Wall Thickness

1/16”	Less than .3” wall
1/8” – 3/16”	.3” wall - .75” wall
1/4” – 5/16”	.75’ wall – 1.5” wall

6. After the proper melt bead has been achieved, move the pipe ends away from the heater plate, remove the heater plate, and quickly move the pipe ends together and apply the proper fusion pressure. Do not slam the ends together. Fusion pressure is applied to form a double roll-back bead and pressure is held through the cool down time.

   Note: When fusing two long pieces of pipe make sure the drag factor is taken into account. Drag factor will affect the hydraulic gauge pressure.

7. Allow the joint to cool until your finger can remain comfortably on the fusion bead. *(Below 110° F)* ***Do not touch hot molten plastic!*** A straight blade screwdriver can be used to test the bead to insure it has hardened and has substantially cooled. Typical cool down time is one minute per inch diameter but will vary with wall thickness and ambient temperature.

   Do not pressure test, install, or rough handle for an additional 30 minutes.

Flying W Plastics

Recommended Socket Fusion Procedure

The following is general instructions recommended by FWP and is not intended to replace or supersede the specific instructions furnished by manufacturer of the socket fusion equipment.

1. Preheat heating tool to (490 – 510) Deg. F. Surface temperature should be checked and adjusted with a surface pyrometer.

2. Chamfer pipe ends and clean pipe ends with a clean rag.

3. Place cold ring on the pipe and utilize depth gauge to set stab depth.

4. Push fitting on the heater and push pipe in the heater socket keeping both in place for the prescribed heating cycle. Insure both are fully inserted.

5. At the completion of the heat cycle, "briskly" pull the pipe & fitting from the tool; do not twist.

6. Push the fitting on the pipe until the cold ring is flush with the fitting. Push smoothly and straight, do not twist. Melt bead must be pressed evenly against a minimum of 50% of the fitting face. Push smoothly and straight; do not twist.

7. Hold together for the prescribed cool down time.

Socket Fusion Time Cycles

Pipe Size	Heating Time	Cold Weather Time	Cooling time	Cooling Time to Tie-in
1/2"	10 seconds	12 seconds	30 seconds	10 minutes
3/4"	13 seconds	16 seconds	30 seconds	10 minutes
1'"	15 seconds	18 seconds	30 seconds	10 minutes
1-1/4"	18 seconds	21 seconds	60 seconds	15 minutes
1-1/2"	18 seconds	21 seconds	60 seconds	15 minutes
2"	24 seconds	28 seconds	60 seconds	15 minutes

FOR CTS REDUCE BY 10%

P.O. BOX 759

GLENVILLE, WV 26351

304-462-5779

IPS PipeData (Iron Pipe Size Outside Diameter)

		IPS SDR -7			IPS SDR - 7.3			IPS SDR - 9			IPS SDR - 11			IPS SDR - 13.5		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
1/2"	0.840	0.120	0.58	0.12	0.115	0.59	0.11	0.093	0.64	0.10	0.076	0.67	0.08	0.062	0.70	0.07
3/4"	1.050	0.150	0.73	0.19	0.144	0.74	0.18	0.117	0.80	0.15	0.095	0.84	0.13	0.078	0.88	0.10
1"	1.315	0.188	0.91	0.29	0.180	0.93	0.28	0.146	1.00	0.23	0.120	1.06	0.20	0.097	1.10	0.16
1-1/4"	1.660	0.237	1.15	0.46	0.227	1.17	0.45	0.184	1.26	0.37	0.151	1.34	0.31	0.123	1.39	0.26
1-1/2"	1.900	0.271	1.32	0.61	0.260	1.34	0.59	0.211	1.45	0.49	0.173	1.53	0.41	0.141	1.60	0.34
2"	2.375	0.339	1.65	0.95	0.325	1.68	0.91	0.264	1.81	0.77	0.216	1.91	0.64	0.176	2.00	0.53
2-1/2"	2.875	0.411	2.00	1.39	0.389	2.05	1.33	0.319	2.19	1.12	0.261	2.32	0.94	0.213	2.42	0.78
3"	3.500	0.500	2.44	2.06	0.479	2.48	1.99	0.389	2.67	1.66	0.318	2.82	1.39	0.259	2.95	1.16
4"	4.500	0.643	3.13	3.40	0.616	3.19	3.28	0.500	3.44	2.75	0.409	3.63	2.30	0.333	3.79	1.91
5"	5.563	0.795	3.87	5.19	0.762	3.94	5.02	0.618	4.25	4.20	0.506	4.49	3.52	0.412	4.68	2.92
6"	6.625	0.946	4.61	7.37	0.908	4.70	7.12	0.736	5.06	5.96	0.602	5.34	4.99	0.491	5.58	4.15
8"	8.625	1.232	6.01	12.49	1.182	6.12	12.06	0.958	6.59	10.10	0.784	6.96	8.46	0.639	7.27	7.03
10"	10.750	1.536	7.49	19.40	1.473	7.62	18.73	1.194	8.21	15.68	0.977	8.67	13.14	0.796	9.06	10.92
12"	12.750	1.821	8.88	27.28	1.747	9.04	26.35	1.417	9.74	22.06	1.159	10.29	18.49	0.944	10.74	15.36
14"	14.000	2.000	9.76	32.90	1.918	9.93	31.77	1.556	10.70	26.60	1.273	11.30	22.29	1.037	11.80	18.52
16"	16.000	2.286	11.15	42.97	2.192	11.35	41.50	1.778	12.23	34.74	1.455	12.91	29.12	1.185	13.48	24.19
18"	18.000	2.571	12.54	54.38	2.466	12.77	52.53	2.000	13.76	43.97	1.636	14.53	36.85	1.333	15.17	30.62
20"	20.000	2.857	13.94	67.13	2.740	14.19	64.85	2.222	15.28	54.29	1.818	16.14	45.49	1.481	16.85	37.80
22"	22.000	3.143	15.33	81.23	3.014	15.61	78.46	2.444	16.81	65.69	2.000	17.76	55.05	1.630	18.54	45.74
24"	24.000	3.429	16.73	96.67	3.288	17.03	93.38	2.667	18.34	78.17	2.182	19.37	65.51	1.778	20.23	54.43
26"	26.000	3.714	18.12	113.46	3.562	18.44	109.59	2.889	19.87	91.74	2.364	20.98	76.88	1.926	21.91	63.88

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

P.O. BOX 759

GLENVILLE, WV 26351

304-462-5779

FLYING W PLASTICS, INC.

IPS PipeData (Iron Pipe Size Outside Diameter)

		IPS SDR - 15.5			IPS SDR - 17			IPS SDR - 21			IPS SDR - 26			IPS SDR - 32.5		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
1/2"	0.840															
3/4"	1.050															
1"	1.315	0.085	1.13	0.14	0.077	1.15	0.13									
1-1/4"	1.660	0.107	1.43	0.23	0.098	1.45	0.21									
1-1/2"	1.900	0.123	1.64	0.30	0.112	1.66	0.28									
2"	2.375	0.153	2.05	0.47	0.140	2.07	0.43	0.113	2.13	0.35						
2-1/2"	2.875	0.185	2.48	0.69	0.169	2.51	0.63	0.137	2.58	0.52						
3"	3.500	0.226	3.02	1.02	0.206	3.06	0.94	0.167	3.14	0.77	0.135	3.21	0.63	0.108	3.27	0.50
4"	4.500	0.290	3.88	1.69	0.265	3.93	1.55	0.214	4.04	1.27	0.173	4.13	1.03	0.138	4.20	0.83
5"	5.563	0.359	4.80	2.58	0.327	4.86	2.36	0.265	5.00	1.94	0.214	5.10	1.58	0.171	5.20	1.28
6"	6.625	0.427	5.71	3.65	0.390	5.79	3.35	0.315	5.95	2.75	0.255	6.08	2.24	0.204	6.19	1.81
8"	8.625	0.556	7.44	6.19	0.507	7.54	5.68	0.411	7.75	4.66	0.332	7.92	3.80	0.265	8.06	3.07
10"	10.750	0.694	9.27	9.62	0.632	9.40	8.82	0.512	9.66	7.23	0.413	9.87	5.90	0.331	10.04	4.76
12"	12.750	0.823	11.00	13.53	0.750	11.16	12.41	0.607	11.46	10.18	0.490	11.71	8.30	0.392	11.91	6.70
14"	14.000	0.903	12.08	16.31	0.824	12.25	14.97	0.667	12.58	12.27	0.538	12.85	10.01	0.431	13.08	8.08
16"	16.000	1.032	13.81	21.30	0.941	14.00	19.55	0.762	14.38	16.03	0.615	14.69	13.08	0.492	14.95	10.55
18"	18.000	1.161	15.53	26.96	1.059	15.75	24.74	0.857	16.18	20.28	0.692	16.53	16.55	0.554	16.82	13.35
20"	20.000	1.290	17.26	33.29	1.176	17.50	30.54	0.952	17.98	25.04	0.769	18.36	20.43	0.615	18.69	16.48
22"	22.000	1.419	18.99	40.28	1.294	19.25	36.96	1.048	19.77	30.30	0.846	20.20	24.72	0.677	20.56	19.95
24"	24.000	1.548	20.71	47.93	1.412	21.00	43.98	1.143	21.57	36.06	0.923	22.04	29.42	0.738	22.43	23.74
26"	26.000	1.677	22.44	56.25	1.529	22.75	51.62	1.238	23.37	42.32	1.000	23.88	34.53	0.800	24.30	27.86

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

Flying W Plastics, Inc.

P.O. BOX 759

GLENVILLE, WV 26351

304-462-5779

DIPS PipeData (Ductile Iron Pipe Size Outside Diameter)

		DIPS SDR - 7			DIPS SDR - 7.3			DIPS SDR - 9			DIPS SDR - 11		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
3"	3.96							0.44	3.02	2.13	0.36	3.19	1.78
4"	4.800	0.686	3.34	3.87	0.658	3.40	3.74	0.533	3.66	3.13	0.436	3.87	2.62
6"	6.900	0.986	4.81	7.99	0.945	4.89	7.72	0.767	5.27	6.46	0.627	5.57	5.41
8"	9.050	1.293	6.30	13.75	1.240	6.42	13.28	1.006	6.91	11.12	0.823	7.30	9.32
10"	11.100	1.590	7.72	20.72	1.521	7.87	19.97	1.233	8.48	16.72	1.009	8.96	14.01
12"	13.200	1.890	9.19	29.30	1.808	9.36	28.25	1.467	10.09	23.65	1.200	10.65	19.82
14"	15.300	2.190	10.65	39.35	2.096	10.85	37.95	1.700	11.69	31.77	1.391	12.35	26.62
16"	17.400	2.490	12.12	50.89	2.384	12.34	49.08	1.933	13.30	41.09	1.582	14.04	34.43
18"	19.500	2.786	13.59	63.82	2.671	13.83	61.64	2.167	14.90	51.61	1.773	15.74	43.25
20"	21.600	3.086	15.05	78.30	2.959	15.32	75.64	2.400	16.51	63.32	1.964	17.43	53.06
24"	25.800	3.686	17.98	111.72	3.534	18.30	107.91	2.867	19.72	90.34	2.345	20.82	75.71

		DIPS SDR - 13.5			DIPS SDR - 17			DIPS SDR - 21			DIPS SDR - 26		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
3"	3.96	0.293	3.33	1.48	0.233	3.46	1.19	0.189	3.55	0.98			
4"	4.800	0.356	4.04	2.18	0.282	4.20	1.76	0.229	4.31	1.44	0.185	4.40	1.18
6"	6.900	0.511	5.81	4.50	0.406	6.03	3.64	0.329	6.20	2.98	0.265	6.33	2.43
8"	9.050	0.670	7.62	7.74	0.532	7.92	6.25	0.431	8.13	5.13	0.348	8.31	4.18
10"	11.100	0.822	9.35	11.64	0.653	9.71	9.41	0.529	9.97	7.71	0.427	10.19	6.29
12"	13.200	0.978	11.12	16.47	0.776	11.55	13.31	0.629	11.86	10.91	0.508	12.12	8.90
14"	15.300	1.133	12.89	22.12	0.900	13.39	17.88	0.729	13.75	14.65	0.588	14.05	11.96
16"	17.400	1.289	14.66	28.61	1.024	15.23	23.12	0.829	15.64	18.95	0.669	15.98	15.46
18"	19.500	1.444	16.43	35.93	1.147	17.06	29.04	0.929	17.53	23.80	0.750	17.91	19.42
20"	21.600	1.600	18.20	44.09	1.271	18.90	35.63	1.029	19.41	29.21	0.831	19.83	23.83
24"	25.800	1.911	21.74	62.90	1.518	22.58	50.83	1.229	23.19	41.67	0.992	23.69	34.00

Pipe weights are calculated in accordance with PPI TR-7. Average ID is calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual inside diameter will vary. Pipe dimensions are in accordance with applicable ASTM standards.

FLYING W PLASTICS, INC.
800-327-4735

CTS PipeData

		250 PSI - SDR-9		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)
3/4"	0.875	0.097	0.66	0.10
1"	1.125	0.125	0.86	0.17
1-1/4"	1.375	0.153	1.05	0.26
1-1/2"	1.625	0.181	1.24	0.36
2"	2.125	0.236	1.62	0.61

Schedule HDPE Conduit

		Schedule 40			Schedule 80		
Pipe Size	Nominal OD	Min. Wall	Average ID	Weight (lbs/ft.)	Min. Wall	Average ID	Weight (lbs/ft.)
1"	1.315	0.133	1.03	0.22	0.179	0.93	0.28
1-1/4"	1.660	0.140	1.36	0.29	0.191	1.25	0.38
1-1/2"	1.900	0.145	1.59	0.35	0.200	1.47	0.47
2"	2.375	0.154	2.04	0.47	0.218	1.91	0.64
2-1/2"	2.875	0.203	2.44	0.74	0.276	2.28	0.98
3"	3.500	0.216	3.04	0.97	0.300	2.86	
4"	4.500	0.237	3.99	1.39	0.337	3.78	1.92
5"	5.563	0.258	5.01	1.88	0.375	4.76	2.67
6"	6.625	0.280	6.03	2.44	0.432	5.70	3.67

Note: For conduit that is SDR size see IPS chart on reverse side.

SIDR PipeData *

Controlled Inside Diameter Water Pipe

		250 PSI - SIDR-7			200 PSI - SIDR-9			160 PSI - SIDR-11.5			125 PSI - SIDR-15		
Pipe Size	Nominal ID	Min. Wall	Average OD*	Weight (lbs/ft.)	Min. Wall	Average OD	Weight (lbs/ft.)	Min. Wall	Average OD	Weight (lbs/ft.)	Min. Wall	Average OD	Weight (lbs/ft.)
1/2"	0.622	0.089	0.81	0.088	0.069	0.77	0.067	*0.060*	0.75	0.057	*0.060*	0.75	0.057
3/4"	0.824	0.118	1.07	0.155	0.092	1.02	0.117	*0.072*	0.98	0.090	*0.060*	0.95	0.074
1'	1.049	0.150	1.37	0.251	0.117	1.30	0.189	0.091	1.24	0.145	0.070	1.20	0.109
1-1/4"	1.380	0.197	1.80	0.434	0.153	1.71	0.328	0.120	1.63	0.250	0.092	1.58	0.188
1-1/2"	1.610	0.230	2.10	0.590	0.179	1.99	0.446	0.140	1.91	0.341	0.107	1.84	0.256
2"	2.067	0.295	2.69	0.973	0.230	2.55	0.735	0.180	2.45	0.562	0.138	2.36	0.422
3"	3.068									0.000	0.205	3.50	0.930
4"	4.026							0.350	4.77	2.131			

***The average OD is ID + (2 x min. wall) x 6% - this is ID controlled pipe and OD may vary slightly.**

Flying W Plastics, Inc.

P. O. Box 759

Glenville, West Virginia 26351

(800) 327-4735

Truckload Table

IPS - Loads - 40 ft

Size	Joints/ Pallet	Feet/ Pallet	Plt/ Trk	LF 40'S
2"	100	4000	12	48,000
3"	38	1520	16	24,320
4"	29	1160	14	16,240
5"	23	920	10	9,200
6"	20	800	10	8,000
7"	17	680	8	5,400
8"	14	560	8	4,480
10"	5/4	200/160	16	2,880
12"	4	160	14	2,240
14"	4/3	160/120	12	1,680
16"	3	120	10	1,200
18"	2/3	80/120	10	1,000
20"	2/3	80/120	8	800
22"	2	80	6	480
24"	2	80	6	480
26"	2/1	80/40	6	360

IPS - Loads - 50 ft

Size	Joints/ Pallet	Feet/ Pallet	Plt/ Trk	LF 50'S
2"	100	5000	14	70,000
3"	38	1900	16	30,400
4"	29	1450	14	20,300
5"	23	1150	12	13,800
6"	20	1000	9	9,000
7"	17	850	8	6,800
8"	14	700	8	5,600
10"	5/4	250/200	16	3,600
12"	4	200	14	2,800
14"	4/3	200/150	12	2,100
16"	3	150	10	1,500
18"	2/3	100/150	10	1,250
20"	2/3	100/150	8	1,000
22"	2	100	6	600
24"	2	100	6	600
26"	2/1	100/50	6	450

Coil Pipe

Size	Ft./Coil x Pallet	Pallets/ Truck	Feet/ Truck
3/4"	500 x 10	26	130,000
1"	500 x 8	26	104,000
1 1/4"	500 x 6	26	78,000
1 1/2"	500 x 8	9	40,000
2"	500 x 7	7	24,500
3"	500 x 5	6	15,000
4"	500 x 3	6	9,000
5"	500	8	4,000
6"	500	8	4,000

DIPS - Loads - 40 ft

Size	Joints/ Pallet	Feet/ Pallet	Plt/ Trk	LF 40'S
3"	32	1280	14	17,920
4"	26	1040	14	14,560
6"	13	520	14	7,280
8"	14	560	6/.5	4,080
10"	5/4	200/160	16	2,880
12"	4/3	160/120	12	1,680
14"	3	120	10	1,200
16"	2/3	80/120	10	1,000
18"	2/3	80/120	8	800
20"	2/2	80	6	480
24"	2/1	80/40	6	360

DIPS - Loads - 50 ft

Size	Joints/ Pallet	Feet/ Pallet	Plt/ Trk	LF 50'S
3"	32	1600	14	22,400
4"	26	1300	12	15,600
6"	13	650	14	9,100
8"	14	700	6	4,200
10"	5/4	250/200	14	3,150
12"	4/3	200/150	12	2,100
14"	3	150	10	1,500
16"	2/3	100/150	10	1,250
18"	2/3	100/150	8	1,000
20"	2/2	100	6	600
24"	2/1	100/50	6	450

Max. Number of Reels Per Truck

Reel Diameter	Sizes Available	Reels/ Truck
70"	1/2"-2"	18
84"	1/2" - 2"	14
96"	1" - 4"	12
102"	2" - 4"	12
114"	3" - 6"	8
120"	3" - 6"	8

The above quantities are based on volume (48' long x 102" wide flat bed trailer). Check load weight on heavy wall pipe to ensure load does not exceed trucking limitations. Max Wt. = 46,000#

FLYING "W" PLASTICS

HIGH DENSITY POLYETHYLENE (HDPE)
CHEMICAL RESISTANCE

Legend: S = Satisfactory O = Some Attack U = Unsatisfactory

	70*F	140*F
Acetaldehyde	S	O
Acetic acid 1-10%	S	S
Acetic acid 10-60%	S	O
Acetic acid 80-100%	S	O
Acetic anhydride	S	S
Acetone	S	S
Acids, aromatic	S	S
Acrylic emulsions	S	S
Adipic acid	S	S
Aluminum chloride dilute	S	S
Aluminum chloride Conc.	S	S
Aluminum fluoride Conc.	S	S
Aluminum sulfate Conc.	S	S
Alums (all types) Conc.	S	S
Amino acetic acid	S	S
Ammonia 100% dry gas	S	S
Ammonium acetate	S	S
Ammonium bromide	S	S
Ammonium carbonate	S	S
Ammonium chloride Sat'd	S	S
Ammonium fluoride 20%	S	S
Ammonium hydroxide	S	S
Ammonium nitrate sat'd	S	S
Ammonium persulfate sat'd	S	S
Ammonium sulfate sat'd	S	S
Ammonium sulfide sat'd	S	S
Ammonium thiocyanate	S	S
Amyl acetate 100%	O	U
Amyl alcohol 100%	S	S
Amyl chloride 100%	O	U
Aniline 100%	S	U
Anise seed oil	O	U
Antimony chloride	S	S
Aqua regia	O	U
Aromatic hydrocarbons	U	U
Arsenic	S	S
Aspirin	S	S
Barium carbonate sat'd	S	S
Barium chloride sat'd	S	S
Barium sulfate sat'd	S	S
Barium sulfide sat'd	S	S
Benzene sulfonic acid	S	S
Bixmuth carbonate sat'd	S	S
Black liquor	S	S
Borax cold sat'd	S	S
Boric acid dilute	S	S
Bromic acid 10%	S	S
Bromine liquid 100%	O	U
Butanediol 10%	S	S
Butanediol 60%	S	S
Butanediol 100%	S	S

	70*F	140*F
Butter	S	S
Butyl acetate 100%	O	U
Butyl alcohol 100%	S	S
Butyl glycol	S	S
Butyric acid 100%	S	S
Calcium Bisulfide	S	S
Calcium carbonate sat'd	S	S
Calcium chlorate sat'd	S	S
Calcium hypochlorite bleach	S	S
Calcium nitrate 50%	S	S
Calcium sulfate	S	S
Carbon dioxide 100% dry	S	S
Carbon dioxide 100% wet	S	S
Carbon dioxide cold sat'd	S	S
Carbon monoxide	S	S
Chlorine liquid	O	U
Chlorosulfonic Acid 100%	U	U
Chromic Acid 50%	S	O
Cider	S	S
Coconut oil alcohols	S	S
Copper chloride sat'd	S	S
Copper cyanide sat'd	S	S
Copper fluoride 2%	S	S
Copper Nitrate sat'd	S	S
Copper sulfate dilute	S	S
Copper sulfate sat'd	S	S
Cuprous chloride sat'd	S	S
Cyclohexanone	U	U
Dextrin sat'd	S	S
Dextrose sat'd	S	S
Disodium phosphate	S	S
Diethylene glycol	S	S
Emulsions photographic	S	S
Ether	O	O
Ethyl acetate 100%	O	O
Ethyl alcohol 100%	S	S
Ethyl chloride	O	U
Ethylene glycol	S	S
Ferric chloride sat'd	S	S
Ferric nitrate sat'd	S	S
Ferrous chloride sat'd	S	S
Ferrous sulfate	S	S
Fluoboric acid	S	S
Fluorine	S	U
Fluosilicic acid 32%	S	S
Fluosilicic acid con't	S	S
Formic acid 20%-100%	S	S
Fructose sat'd	S	S

	70*F	140*F
Fuel Oil	S	U
Galic acid sat'd	S	S
Gasolene	S	U
Glycol	S	S
Glycolic acid 30%	S	S
Grape juice	S	S
Grapefruit juice	S	S
Heptane	O	U
Hydrobrobromic acid 50%	S	S
Hydrocyanic acid sat'd	S	S
Hydrochloric acid 30%	S	S
Hydorfluoric acid 40-60%	S	S
Hydrogen 100%	S	S
Hydrogen bromide 10%	S	S
Hydrogen chloride gas dry	S	S
Hydroquinone	S	S
Hydrogen sulfide	S	S
Hypochlorous acid con't	S	S
Inks	S	S
Iodine crystals	O	O
Isobutyl alcohol	S	S
Isopropyl alcohol	S	S
Isopropyl ether	O	U
Kerosene	O	O
Lactic acid 10-90%	S	S
Lanolin	S	S
Lard	S	S
Lead acetate sat'd	S	S
Lead nitrate	S	S
Lemon juice	S	S
Lemon oil	O	U
Lime juice	S	S
Linseed oil	S	S
Magnesium carbonate sat'd	S	S
Magnesium chloride sat'd	S	S
Magnesium hydroxide sat'd	S	S
Magnesium nitrate sat'd	S	S
Magnesium sulfate sat'd	S	S
Mercuric chloride	S	S
Mercuric cyanide sat'd	S	S
Mercurous nitrate sat'd	S	S
Methyl ethyl ketone 100%	U	U
Methyl bromide	O	U
Methylsulfuric acid	S	S
Methylene chloride 100%	U	U
Milk	S	S

FLYING "W" PLASTICS

HIGH DENSITY POLYETHYLENE (HDPE)
CHEMICAL RESISTANCE
Continued

Legend: S = Satisfactory O = Some Attack U = Unsatisfactory

	70*F	140*F
Mineral Oils	S	U
Molasses	S	S
Mustard (prepared)	S	S
Naphtha	O	U
Napthalene	S	U
Natural gas (wet)	S	S
Nickel chloride sat'd	S	S
Nickel nitrate con't	S	S
Nickel sulfate	S	S
Nicotinic acid	S	S
Nitric acid 0-30%	S	S
Nitric acid 30-70%	S	O
Nitric acid 95-100%	U	U
Nitroglycerine	O	U
Octane	S	S
Oleum con't	U	U
Olive oil	S	S
Orange juice	S	S
Oxalic acid dilute	S	S
Oxalic acid sat'd	S	S
Ozone	O	O
Petroleum ether	U	U
Phosphoric acid 0-30%	S	S
Phosphoric acid 90%	S	S
Photographic solutions	S	S
Potassium bicarbonate sat'd	S	S
Potassium carbonate	S	S
Potassium chlorate sat'd	S	S
Potassium chloride sat'd	S	S
Potassium chromate 40%	S	S
Potassium cyanide sat'd	S	S
Potassium ferri cyanide	S	S
Potassium fluoride	S	S
Potassium nitrate sat'd	S	S
Potassium perborate sat'd	S	S
Potassium perchlorate 10%	S	S
Potassium sulfate con't	S	S
Potassium sulfide con't	S	S
Potassium sulfite con't	S	S
Potassium persulfate sat'd	S	S
Propargyl alcohol	S	S
Propylene glycol	S	S
Pyridine	S	O
Rayon coagulating bath	S	S
Resorcinol	S	S

	70*F	140*F
Salicylic acid	S	S
Sea water	S	S
Shortening	S	S
Silicic acid	S	S
Silver nitrate sol'n	S	S
Soap solution con't	S	S
Sodium acetate sat'd	S	S
Sodium benzoate 35%	S	S
Sodium bicarbonate sat'd	S	S
Sodium bisulfate sat'd	S	S
Sodium bisulfite sat'd	S	S
Sodium borate	S	S
Sodium carbonate con't	S	S
Sodium chlorate sat'd	S	S
Sodium dichromate sat'd	S	S
Sodium ferricyanide sat'd	S	S
Sodium ferricyanide	S	S
Sodium fluoride sat'd	S	S
Sodium hydroxide con't	S	S
Sodium hypochlorite	S	S
Sodium nitrate	S	S
Sodium nitrite	S	S
Sodium perborate	S	S
Sodium phosphate	S	S
Sodium sulfide 25% to sat'd	S	S
Sodium sulfite sat'd	S	S
Sodium thiosulphate	S	S
Soybean oil	S	S
Stannous chloride sat'd	S	S
Stannic chloride sat'd	S	S
Starch solution sat'd	S	S
Stearic acid 100%	S	S
Sulfuric acid 0-50%	S	S
Sulfuric acid 70%	S	O
Sulfuric acid 80%	S	U
Sulfuric acid 96%	O	U
Sulfuric acid 98% con't	O	U
Sulfuric acid fuming	U	U
Sulfurous acid	S	S
Tartaric acid	S	S
Tannic acid 10%	S	S
Tea	S	S
Tetrahydrofurane	O	O
Toluene	U	U
Tomato juice	S	S
Transformer oil	S	O
Trisodium phosphate sat'd	S	S
Trichloroethylene	U	U

	70*F	140*F
Turpentine	O	U
Urea	S	S
Urine	S	S
Vanilla extract	S	S
Vaseline	S	S
Vinegar common	S	S
Wetting agents	S	S
Whiskey	S	S
Wines	S	S
Xylene	U	U
Yeast	S	S
Zinc chloride sat'd	S	S
Zinc oxide	S	S
Zinc sulfate sat'd	S	S

NOTE: The above information concerns general chemical resistance only. Since other factors such as permeation, ESCR, and container design are involved full compatibility is recommended.