



2025

# Product Catalog



Integrity Fusion Products

Peachtree City, Georgia

1/1/2025

# An American Dream Come True

Doug Yelken launched **Integrity Fusion Products** out of his garage in 2006, and in 2007, Doug invited Greg Swindell to become part of his exciting new endeavor. Market intuitiveness, wise judgment, capable management, combined with personal dedication, commitment, and hard work – and a little bit of fortunate market timing; the vision of what has become **Integrity Fusion Products** began to take shape.

From the very beginning, Doug built **Integrity Fusion Products** on a foundation of uncompromising principles and focused on his driving desire and unwavering goal to supply the growing US infrastructure market with innovative, high quality Polyethylene piping solutions, serviced with unmatched customer service. **Integrity Fusion Products'** commitment to that desire and goal continues to be the hallmark of our company today.

Since that time, **Integrity Fusion Products** has experienced continued, and unparalleled growth. From the humble 2-man operation working out of a shared warehouse space in 2008, marketing and selling the first large diameter electrofusion products in the US, and a limited line of molded butt fusion fittings; **Integrity Fusion Products** bought their first facility in **2010** and began expanding their operations and their product line by offering innovative and unique **molded HDPE fittings** into the growing number of industries being served.

Driven by a commitment to uncompromising customer service, in **2015** Doug Yelken and Greg Swindell, current VP of Operations, slowly began assembling a team of motivated industry sales, training, and manufacturing professionals to take **Integrity Fusion Products** to the next level. Unsatisfied with having to rely on international production and uncertain and sporadic supply chain issues, Doug's dream of building a manufacturing facility in the US began with his desire to bring all his fitting molds to the US, and to set up a manufacturing base in Georgia. In February of **2018**, Doug launched the company's first major construction project, and built a new facility in Peachtree City, GA, and this location has become the National Headquarters of **Integrity Fusion Products** today.

With sales continuing to grow and a reputation for top-notch customer service becoming more widely recognized in the industry, it quickly became apparent that for Doug to achieve his goal of moving all fitting manufacturing to the US, more floor space was needed, and in **2020**, additional space was added onto the recently built facility to make room for multiple new state-of-the-art injection molding machines and robotic workstations. Doug's intended goal was to move all his existing fitting molds to in-house operations by Dec. **2020**. The growth and expansion did not stop there.

With the continued expansion of our manufacturing capabilities, and with record annual sales increasing year after year; **Integrity Fusion Products** continues to move aggressively forward by maximizing our manufacturing footprint to accommodate our continuously evolving domestic injection molding initiative by adding more equipment and robotics to better serve the growing demand. In May of **2024**, that plan took another giant step forward when ground was broken for the construction of a new 65,000 sq. ft. dedicated warehouse next door to our National Headquarters on the 15-acre **Integrity Fusion Products manufacturing campus**. That warehouse is targeted to become fully operational by Dec. **2024** - and we are not done yet!

From one man's dream, to a two man operation, to a team of dedicated manufacturing, sales, technical, and administrative professionals, all working together with a unified goal of manufacturing high quality **HDPE fittings**, and delivering those high quality products to our customers with exceptional world-class customer service; **Integrity Fusion Products** has become one of only a small handful of a domestic manufacturers of High Density Polyethylene products, employing over 100 dedicated employees contributing their time, their ideas, and their efforts into moving **Integrity Fusion Products** strongly into the future.

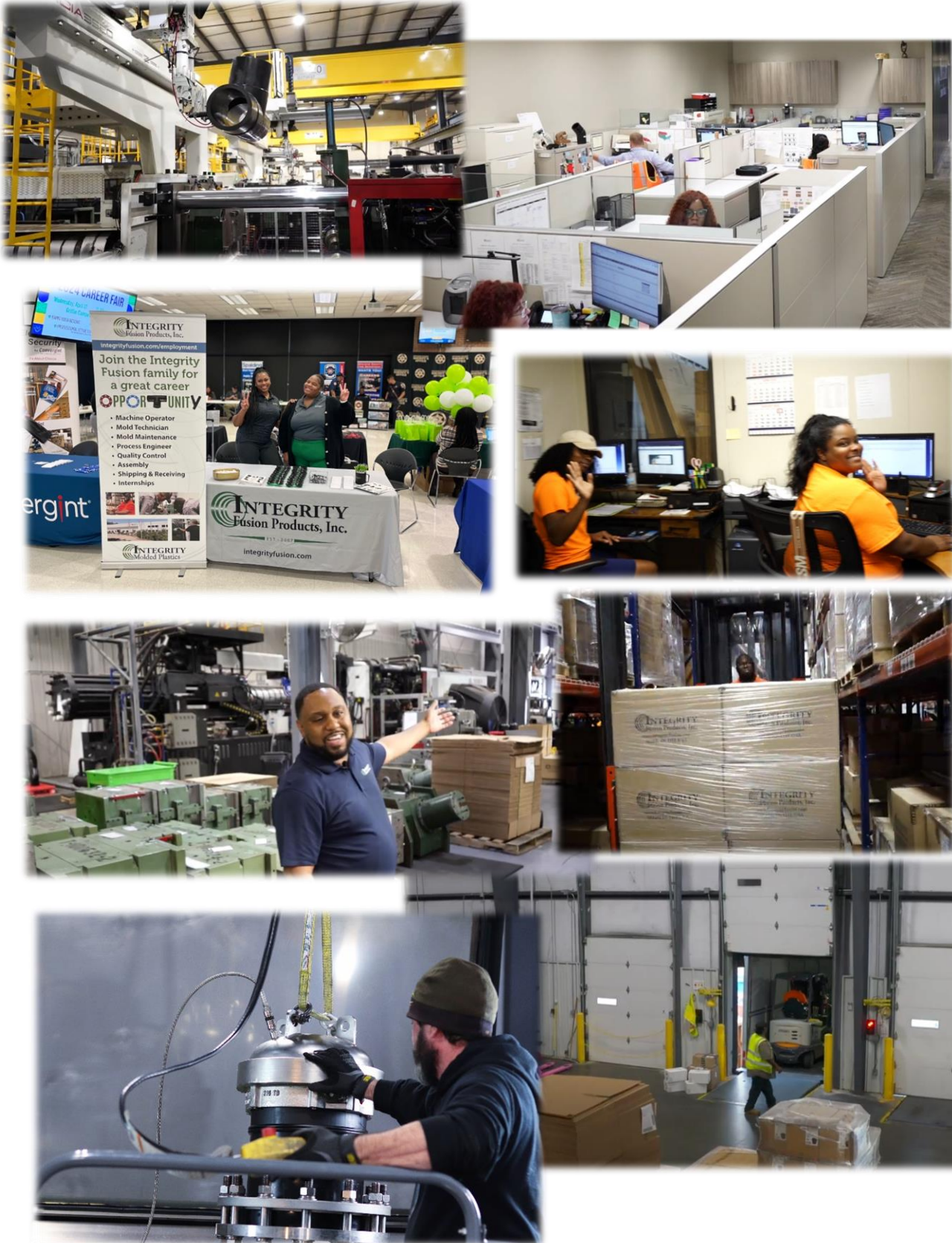
The employees and management of **Integrity Fusion Products** understand that we cannot be successful unless our customers are successful, and we take seriously our commitment to enhancing our customers' success by providing the highest quality products, and responsive services to them. **Integrity Fusion Products** is dedicated to continuously striving to develop and improve our manufacturing and quality assurance programs to ensure the highest level of quality, reliability, and value to meet our customers' needs. **Integrity is not just our name – it is our character!**



**We don't just manufacture fittings - we manufacture solutions!**

## Company Values:

“Innovation, Service, Integrity, Excellence, Loyalty”



**Integrity Fusion Products**  
270 Parkade Court  
Peachtree City, GA 30269

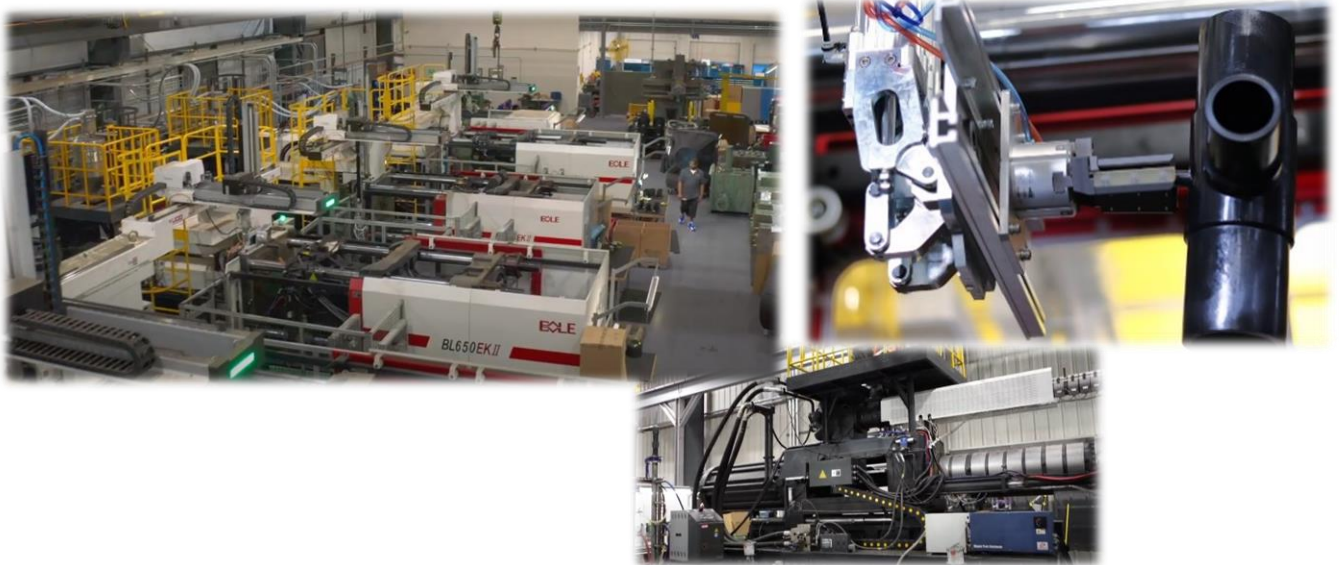
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**Phone: 770.632.7530**  
**Toll Free: 888.770.6330**  
**www.integrityFusion.co**

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## Company Vision Statement:

**“To be a leading injection molded fittings manufacturing company, renowned for our commitment to excellence, unwavering loyalty, and a family-oriented approach that fosters a supportive and innovative environment for our customers and employees alike.”**



## Company Mission Statement:

**“To provide top-quality injection molding solutions by leveraging our expertise, fostering loyalty, and supporting our employees and customers with integrity and excellence.”**



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# INTEGRITY Fusion Products, Inc.

## Injection Molded Butt Fusion Fittings

**Integrity Fusion Products** offers a full line of injection molded **IPS** and **DIPS** HDPE Fittings that are manufactured in a variety of nominal pipe sizes and SDR's, in our manufacturing facility located in Peachtree City, GA. **Injection Molded HDPE Fittings** from Integrity Fusion Products are manufactured and tested to meet and/or exceed the requirements of **ASTM D2513**, **ASTM D3261**, and **ANSI/AWWA C901** and **C906**, and **FM 1613** (*where applicable*) for use with outside diameter-controlled polyethylene pipe and fittings conforming to **ASTM D2513**, **ASTM D3035**, and **ASTM F-714**. Integrity Fusion Product **Molded HDPE Fittings** can be heat fused or electrofused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408 / PE4710 / PE100** resin that complies to **ASTM D3350**.



### Molded PE3408 / PE4710 / PE100 HDPE Fittings

**Molded HDPE Fittings, Flange Adapters, and MJ Adapters** manufactured by Integrity Fusion Products in Peachtree City, GA, are all-purpose, injection molded **High-Density Polyethylene Fittings** that are designed and manufactured for use in applications that include, but are not limited to:

- Oil and gas production
- Municipal potable water distribution and service lines
- Stormwater conveyance
- Irrigation
- Mining
- Cable
- Natural gas distribution
- Wastewater conveyance
- Drainage
- Industrial piping applications
- Landfill
- Telecom Conduit



Integrity Fusion Products manufactures **Molded HDPE Fittings** in a variety of sizes, configurations and SDR's that are produced from virgin, pre-blended, NSF listed bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**.

**Injection Molded HDPE Fittings** from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

- ASTM D2513 - Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- ASTM D3350 - Specification for Polyethylene Plastic Pipes and Fittings Materials
- ASTM D3261 - Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
- ASTM F714 - Specifications for HDPE Pipe Dimensions
- AWWA C901 - Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service
- AWWA C906 - Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works
- FM 1613 - Approval Standard: Plastic Pipe and Fittings for Underground Fire Protection Service
- ANSI/NSF 61 - Plastic Piping System Components & Related Materials
- ASTM F2880 - Specification for lap-Joint Type Flange Adapters for use on Polyethylene Pressure Pipe

**Integrity Fusion Products Injection Molded HDPE Fittings are tested in accordance with the following standard ASTM test methods.**

- ASTM D1598 - Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
- ASTM D1599 - Short-Term Hydraulic Pressure Failure of Plastic Pipe, Tubing and Fittings.
- ASTM D2122 - Test method for Determining Dimensions of Thermoplastic Pipe and Fittings.

**Injection Molded HDPE Fittings** from Integrity Fusion Products can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408 / PE4710 / PE100** resin that complies to **ASTM D3350**.

**Injection Molded HDPE Fittings** from Integrity Fusion Products are designed for use on HDPE pressure pipe applications that conform to **ASTM F714, D2513** and **D3350** and are pressure rated according to industry guidelines for natural gas and water applications. (TABLE 1)

Pressure Rating of IntegriFuse PE4710 Molded Fittings		
Fitting SDR (Standard Dimension Ratio)	MAOP (Design Factor of .63)	MAOP (Gas) (Design Factor of .40)
7/9	333/250	125/125
11/17	200/125	125/80
21	100	64

**NOTE: Pressure ratings are based on an operating temperature of up to 73° ambient temperature and will need to be reduced for higher temperatures and certain applications.**

TABLE 1

### Conditions for the Required De-Rating of a Molded Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings **must be de-rated for elevated temperatures in all service applications**, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR Title 49 Part 192 regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

*API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0*

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings **should not exceed 140° F.**

Fitting MAOP by SDR vs. Operating Temperature				
SDR	73.4° F	100° F	120° F	140° F
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	73.4° F	100° F	120° F	140° F
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

*Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5*

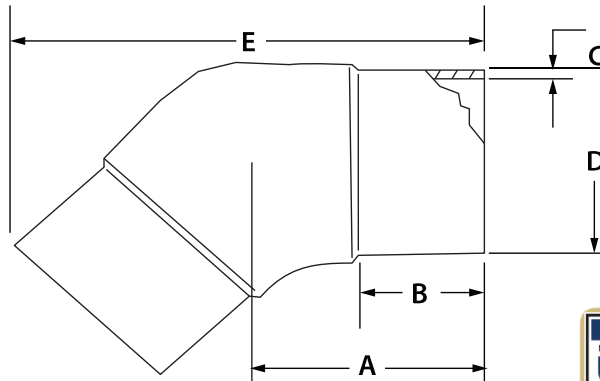
### Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	1.0
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR Title 49 part 192)	1.0
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	.5
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	.5

**Injection Molded Fittings** from Integrity Fusion Products have a strong resistance to chemical compounds. For more information on the chemical resistance of PE4710 resin, please reference PPI Technical Report TR-19.

**Injection Molded Fittings** can be stored outdoors but it is highly recommended that **they** be stored indoors in their original packaging. Black HDPE fittings stored properly indoors have unlimited shelf life.





<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	45° Elbow
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9, 7
Manufactured and tested to meet requirements of:		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
For use on pipe and fittings conforming to:		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

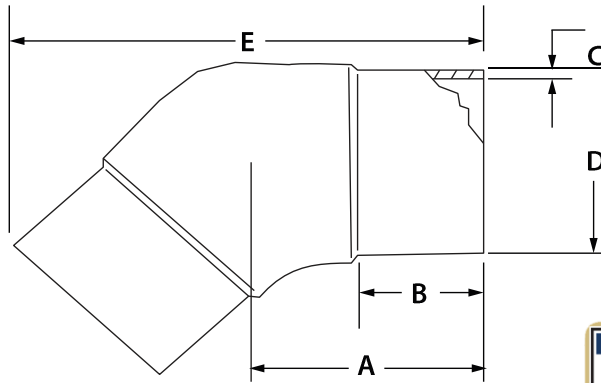
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.140	2.375	6.380	0.30	100002	-----
3" IPS	4.720	3.86	0.206	3.500	9.330	0.90	100006	-----
4" IPS	5.310	4.21	0.265	4.500	10.63	1.70	100010	-----
6" IPS	6.890	5.35	0.390	6.625	14.09	4.40	100014	-----
8" IPS	8.460	6.54	0.507	8.625	17.48	9.80	100018	-----
10" IPS	10.04	7.64	0.632	10.75	20.94	14.9	100022	-----
12" IPS	10.63	7.80	0.750	12.75	22.64	22.1	100024	-----

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.216	2.375	6.380	0.40	100001	FM 200
3" IPS	4.720	3.86	0.318	3.500	9.330	1.20	100005	FM 200
4" IPS	5.310	4.21	0.409	4.500	10.63	2.10	100009	FM 200
6" IPS	6.890	5.35	0.602	6.625	14.09	6.10	100013	FM 200
8" IPS	8.460	6.54	0.784	8.625	17.48	12.6	100017	FM 200
10" IPS	10.04	7.64	0.977	10.75	20.94	21.3	100021	FM 200
12" IPS	10.63	7.80	1.159	12.75	22.64	31.4	100023	FM 200



### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.264	2.375	6.380	0.40	100004	FM 250
3" IPS	4.720	3.86	0.389	3.500	9.330	1.40	100008	FM 250
4" IPS	5.310	4.21	0.500	4.500	10.63	2.60	100012	FM 250
6" IPS	6.890	5.35	0.736	6.625	14.09	7.20	100016	FM 250
8" IPS	8.460	6.54	0.958	8.625	17.48	14.6	100020	FM 250
10" IPS	10.04	7.64	1.194	10.75	20.94	16.4	100043	-----
12" IPS	10.63	7.80	1.417	12.75	22.64	41.1	100030	-----

### IPS

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

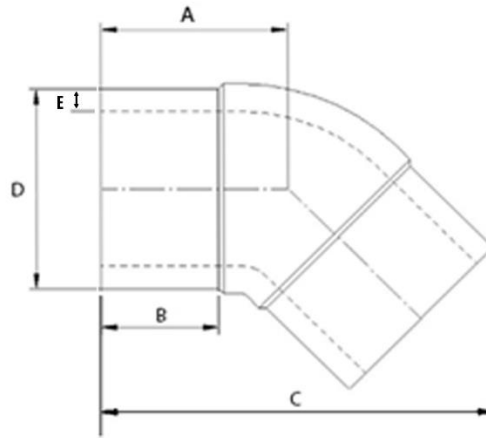
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	2.64	0.339	2.375	6.380	0.50	100003	FM 335
3" IPS	4.720	3.86	0.500	3.500	9.330	1.70	100007	FM 335
4" IPS	5.310	4.21	0.643	4.500	10.63	3.20	100011	FM 335
6" IPS	6.890	5.35	0.946	6.625	14.09	8.70	100015	FM 335
8" IPS	8.460	6.54	1.232	8.625	17.48	17.90	100019	FM 335
10" IPS	10.04	7.64	1.190	10.75	20.94	32.65	100044	-----
12" IPS	10.63	7.80	1.410	12.75	22.64	50.85	100031	-----

### DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
4" IPS	6.050	4.10	0.436	4.800	12.00	3.20	100025	FM 200
6" IPS	7.160	5.10	0.627	6.900	14.56	7.94	100026	FM 200
8" IPS	8.320	5.20	0.823	9.050	17.56	14.65	100027	FM 200
10" IPS	9.110	6.09	1.010	11.10	16.33	23.45	100028	FM 200
12" IPS	11.11	7.56	1.200	13.18	17.56	39.50	100029	FM 200

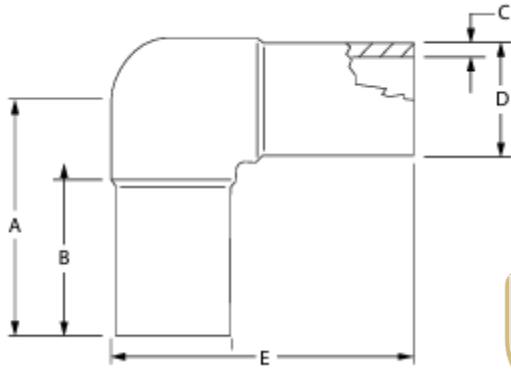


Large Diameter Elbows and Tees are not BABA Compliant

<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	45° Elbow
<b>Resin Status:</b>	NSF Listed Virgin Bi-Modal Resin	<b>Nominal Pipe Sizes:</b>	14", 16", 20"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

Nominal Size	A	B	C	D	E	Weight	Item Code	SDR	FM Class
14" IPS	10.51	6.50	21.02	14.00	1.391	42.77	100035	11	200
16" IPS	12.20	7.17	24.40	16.00	1.582	59.52	100037	11	200
18" IPS	-----	-----	-----	-----	-----	-----	-----	N/A	N/A
20" IPS	14.76	8.74	29.52	24.00	1.964	143.30	100041	11	200
24" IPS	-----	-----	-----	-----	-----	-----	-----	N/A	N/A



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	90° Elbow
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9, 7
Manufactured and tested to meet requirements of:		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
For use on pipe and fittings conforming to:		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

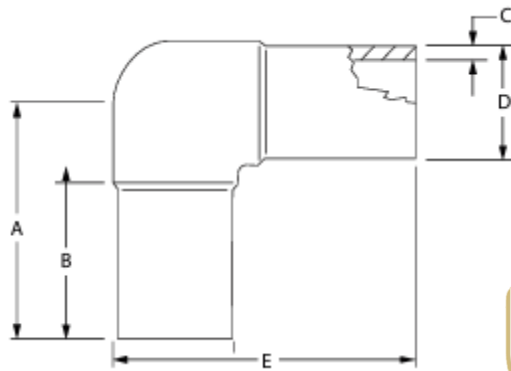
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	4.36	2.64	0.140	2.375	5.63	.04	100106	-----
3" IPS	5.85	3.50	0.206	3.500	7.73	1.1	100110	-----
4" IPS	6.85	3.80	0.265	4.500	9.21	2.0	100114	-----
6" IPS	8.94	4.75	0.390	6.625	12.40	5.4	100118	-----
8" IPS	11.81	7.20	0.507	8.625	16.13	12.5	100122	-----
10" IPS	13.78	8.27	0.632	10.750	19.15	22.0	100126	-----
12" IPS	14.96	8.46	0.750	12.750	21.33	36.7	100128	-----

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
¾ IPS	3.19	2.14	0.095	1.050	3.82	0.1	100100	-----
1" IPS	3.31	2.18	0.120	1.315	4.06	0.2	100101	-----
1 ¼" IPS	3.48	2.15	1.151	1.660	4.41	0.3	100102	-----
1 ½" IPS	3.92	2.37	0.173	1.900	5.00	0.4	100103	-----
2" IPS	4.36	2.64	0.140	2.375	5.63	.05	100105	FM 200
3" IPS	5.85	3.50	0.206	3.500	7.73	1.1	100109	FM 200
4" IPS	6.85	3.80	0.265	4.500	9.21	2.0	100113	FM 200
6" IPS	8.94	4.75	0.390	6.625	12.40	5.4	100117	FM 200
8" IPS	11.81	7.20	0.507	8.625	16.13	12.5	100121	FM 200
10" IPS	13.78	8.27	0.632	10.750	19.15	22.0	100125	FM 200
12" IPS	14.96	8.46	0.750	12.750	21.33	36.7	100127	FM 200



### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	4.36	2.64	0.264	2.375	5.630	0.60	100108	FM 250
3" IPS	5.85	3.50	0.389	3.500	7.730	1.70	100112	FM 250
4" IPS	6.85	3.80	0.500	4.500	9.210	3.30	100116	FM 250
6" IPS	8.94	4.75	0.736	6.625	12.00	8.80	100120	FM 250
8" IPS	11.81	7.20	0.958	8.625	16.13	19.6	100124	FM 250
10" IPS	13.78	8.27	1.190	10.75	19.15	34.7	100136	-----
12" IPS	14.96	8.46	1.410	12.75	21.33	57.5	100134	-----

### IPS

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

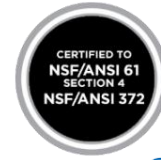
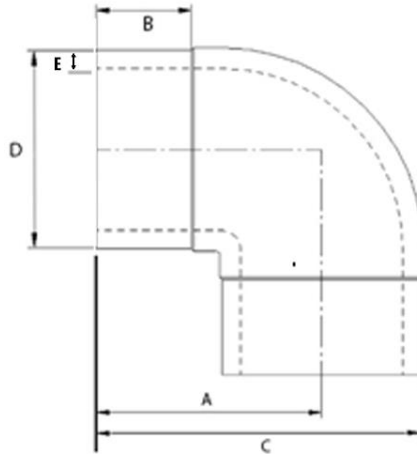
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	4.36	2.64	0.339	2.375	5.630	0.700	100107	FM 335
3" IPS	5.85	3.50	0.500	3.500	7.730	2.200	100111	FM 335
4" IPS	6.85	3.80	0.643	4.500	9.210	4.000	100115	FM 335
6" IPS	8.94	4.75	0.946	6.625	12.40	10.90	100119	FM 335
8" IPS	11.81	7.20	1.232	8.625	16.13	23.90	100123	FM 335
10" IPS	13.78	8.27	1.540	10.75	19.15	42.75	100137	-----
12" IPS	14.96	8.46	1.820	12.75	21.33	69.05	100135	-----

### DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
4" IPS	7.550	4.10	0.436	4.800	10.04	3.20	100129	FM 200
6" IPS	9.670	5.10	0.627	6.900	13.34	8.70	100130	FM 200
8" IPS	11.58	5.20	0.823	9.050	16.33	19.5	100131	FM 200
10" IPS	13.00	5.50	1.010	11.10	18.00	28.5	100132	FM 200
12" IPS	14.00	5.87	1.200	13.20	20.00	43.8	100133	FM 200

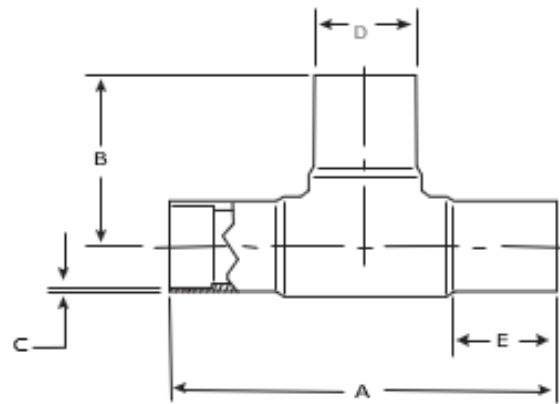


Large Diameter Elbows and Tees are not BABA Compliant

<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	90° Elbow
<b>Resin Status:</b>	NSF Listed Virgin Bi-Modal Resin	<b>Nominal Pipe Sizes:</b>	14", 16", 20"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

Nominal Size	A	B	C	D	E	Weight	Item Code	SDR	FM Class
14" IPS	14.88	6.73	21.88	14.00	1.391	55.11	100150	11	200
16" IPS	16.50	7.40	24.50	16.00	1.582	83.78	100152	11	200
18" IPS	-----	-----	-----	-----	-----	-----	-----	N/A	N/A
20" IPS	22.64	8.86	32.64	20.00	1.964	189.60	100156	11	200
24" IPS	-----	-----	-----	-----	-----	-----	-----	N/A	N/A



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Equal Tee
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	3/4" – 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9, 7
Manufactured and tested to meet requirements of:		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
For use on pipe and fittings conforming to:		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

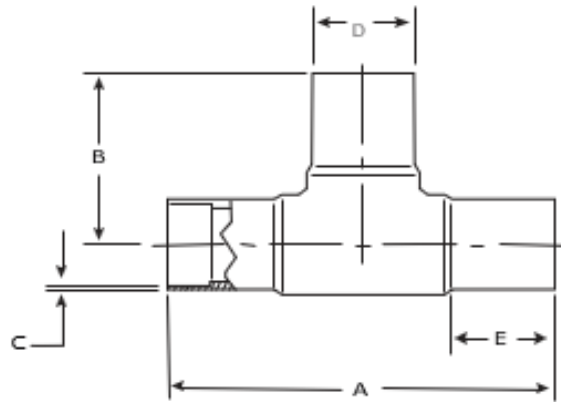
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
3" IPS	11.81	5.910	0.206	3.500	3.54	1.50	100709	----
4" IPS	13.78	6.890	0.264	4.500	3.94	2.80	100713	----
6" IPS	18.11	9.060	0.390	6.625	4.72	7.50	100717	----
8" IPS	23.62	11.81	0.507	8.625	5.71	17.5	100721	----
10" IPS	27.56	13.78	0.632	10.75	6.30	28.3	100725	----
12" IPS	31.57	15.97	0.750	12.75	7.52	47.5	100727	----

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
¾ IPS	6.380	3.190	0.095	1.050	2.14	0.20	100700	----
1" IPS	6.620	3.310	0.120	1.315	2.18	0.20	100701	----
1 ¼" IPS	6.970	3.480	0.151	1.660	2.15	0.40	100702	----
1 ½" IPS	7.840	3.920	0.173	1.900	2.37	0.60	100704	----
2" IPS	8.660	4.330	0.216	2.375	2.48	1.00	100705	FM 200
3" IPS	11.81	5.910	0.318	3.500	3.54	1.50	100708	FM 200
4" IPS	13.78	6.890	0.409	4.500	3.94	3.90	100712	FM 200
6" IPS	18.11	9.060	0.602	6.625	4.72	40.5	100716	FM 200
8" IPS	23.62	11.81	0.784	8.625	5.71	23.2	100720	FM 200
10" IPS	27.56	13.78	0.977	10.75	6.30	39.4	100724	FM 200
12" IPS	31.57	15.97	1.159	12.75	7.52	66.3	100726	FM 200



### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	6.380	3.190	0.264	2.375	2.47	1.10	100707	FM 250
3" IPS	6.620	3.310	0.389	3.500	3.54	2.40	100711	FM 250
4" IPS	6.970	3.480	0.500	4.500	3.94	4.50	100715	FM 250
6" IPS	7.840	3.920	0.736	6.625	4.72	12.3	100719	FM 250
8" IPS	8.660	4.330	0.958	8.625	5.71	25.1	100723	FM 250
10" IPS	11.81	5.910	1.194	10.75	6.30	47.15	100736	-----
12" IPS	13.78	6.890	1.417	12.75	7.52		100737	-----

### IPS

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	6.380	3.190	0.339	2.375	2.47	1.00	100706	FM 335
3" IPS	6.620	3.310	0.500	3.500	3.54	2.90	100710	FM 335
4" IPS	6.970	3.480	0.643	4.500	3.94	5.50	100714	FM 335
6" IPS	7.840	3.920	0.946	6.625	4.72	14.7	100718	FM 335
8" IPS	8.660	4.330	1.232	8.625	5.71	32.1	100722	FM 335
10" IPS	11.81	5.910	1.536	10.75	6.30	58.9	100735	-----
12" IPS	13.78	6.890	1.821	12.75	7.52		100734	-----

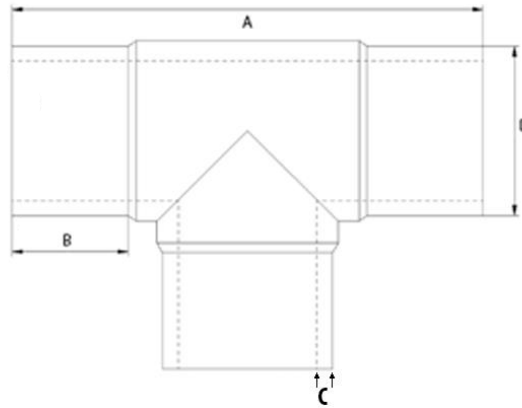
### DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
4" IPS	15.63	7.820	0.436	4.800	4.10	4.80	100728	FM 200
6" IPS	19.34	9.670	0.627	6.900	5.10	11.6	100729	FM 200
8" IPS	23.15	11.58	0.823	9.050	5.20	24.7	100730	FM 200
10" IPS	24.60	12.20	1.200	11.10	5.11	39.0	100731	FM 200
12" IPS	28.45	14.17	1.270	13.25	6.00	70.7	100732	FM 200





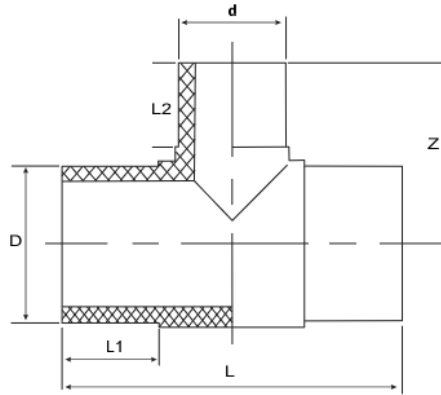
Large Diameter Elbows and Tees are not BABA Compliant

<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Equal Tee
<b>Resin Status:</b>	NSF Listed Virgin Bi-Modal Resin	<b>Nominal Pipe Sizes:</b>	14" – 24"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

Nominal Size	A	B	C	D	Weight	Item Code	SDR	FM Class
14" IPS	31.50	6.50	1.391	14.00	88.18	100750	11	200
16" IPS	34.65	7.09	1.582	16.00	125.66	100752	11	200
18" IPS	38.74	7.87	1.773	18.00	180.78	100754	11	200
20" IPS	42.91	8.66	1.964	20.00	238.01	100756	11	200
24" IPS	51.57	10.04	2.345	20.00	423.29	7000008	11	200

**No Need to be de-rated  
like fabricated fittings**



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Reducing Tee
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Primary Pipe Sizes:</b>	3" – 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

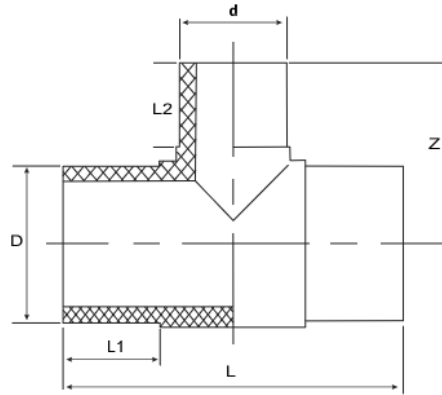
*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

## IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

Nominal Size	L [in.]	D [in.]	d [in.]	L1 [in.]	L2 [in.]	Z [ins.]	Weight	Item Code	FM Class
3 x 2 IPS	11.80	3.500	2.375	3.62	2.48	5.90	1.50	100801	----
4 x 2 IPS	13.78	4.500	2.375	3.94	2.48	6.89	2.50	100803	----
4 x 3 IPS	13.78	4.500	3.500	3.94	3.62	6.89	2.70	100805	----
6 x 2 IPS	18.10	6.625	2.375	4.72	2.48	9.06	6.20	100807	----
6 x 3 IPS	18.10	6.625	3.500	4.72	3.62	9.06	6.40	100809	----
6 x 4 IPS	18.10	6.625	4.500	4.72	3.94	9.06	6.60	100811	----
8 x 2 IPS	23.60	8.625	2.375	5.71	2.48	11.80	14.9	100813	----
8 x 3 IPS	23.60	8.625	3.500	5.71	3.62	11.80	14.3	100815	----
8 x 4 IPS	23.60	8.625	4.500	5.71	3.94	11.80	15.0	100817	----
8 x 6 IPS	23.60	8.625	6.625	5.71	4.72	11.80	15.6	100819	----
10 x 4 IPS	27.40	10.75	4.500	6.30	3.94	13.78	22.0	100821	----
10 x 6 IPS	27.40	10.75	6.625	6.30	4.72	13.78	25.3	100823	----
10 x 8 IPS	27.40	10.75	8.625	6.30	5.71	13.78	26.2	100825	----
12 x 6 IPS	31.40	12.75	6.625	7.48	4.72	15.95	47.1	100827	----
12 x 8 IPS	31.40	12.75	8.625	7.48	5.71	15.95	48.9	100829	----
12 x 10 IPS	31.40	12.75	10.75	7.48	6.30	15.95	52.3	100831	----

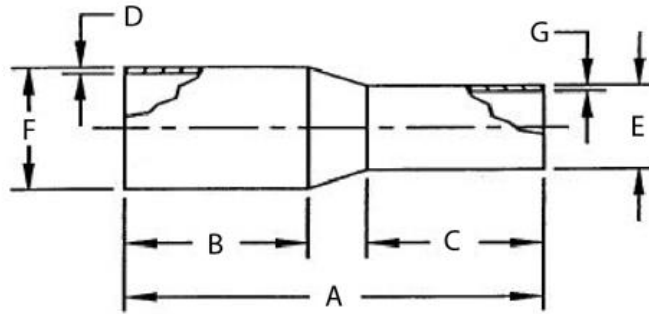


## IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	L [in.]	D [in.]	d [in.]	L1 [in.]	L2 [in.]	Z [ins.]	Weight	Item Code	FM Class
3 x 2 IPS	11.80	3.500	2.375	3.62	2.48	5.90	1.50	100800	FM 200
4 x 2 IPS	13.78	4.500	2.375	3.94	2.48	6.89	2.50	100802	FM 200
4 x 3 IPS	13.78	4.500	3.500	3.94	3.62	6.89	2.70	100804	FM 200
6 x 2 IPS	18.10	6.625	2.375	4.72	2.48	9.06	6.20	100806	FM 200
6 x 3 IPS	18.10	6.625	3.500	4.72	3.62	9.06	6.40	100808	FM 200
6 x 4 IPS	18.10	6.625	4.500	4.72	3.94	9.06	6.60	100810	FM 200
8 x 2 IPS	23.60	8.625	2.375	5.71	2.48	11.80	14.9	100812	FM 200
8 x 3 IPS	23.60	8.625	3.500	5.71	3.62	11.80	14.3	100814	FM 200
8 x 4 IPS	23.60	8.625	4.500	5.71	3.94	11.80	15.0	100816	FM 200
8 x 6 IPS	23.60	8.625	6.625	5.71	4.72	11.80	15.6	100818	FM 200
10 x 4 IPS	27.40	10.75	4.500	6.30	3.94	13.78	22.0	100820	FM 200
10 x 6 IPS	27.40	10.75	6.625	6.30	4.72	13.78	25.3	100822	FM 200
10 x 8 IPS	27.40	10.75	8.625	6.30	5.71	13.78	26.2	100824	FM 200
12 x 6 IPS	31.40	12.75	6.625	7.48	4.72	15.95	47.1	100826	FM 200
12 x 8 IPS	31.40	12.75	8.625	7.48	5.71	15.95	48.9	100828	FM 200
12 x 10 IPS	31.40	12.75	10.75	7.48	6.30	15.95	52.3	100830	FM 200



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Reducer
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Primary Pipe Sizes:</b>	1" – 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9
Manufactured and tested to meet requirements of:		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
For use on pipe and fittings conforming to:		ASTM D2513, ASTM D3035, ASTM F-714	

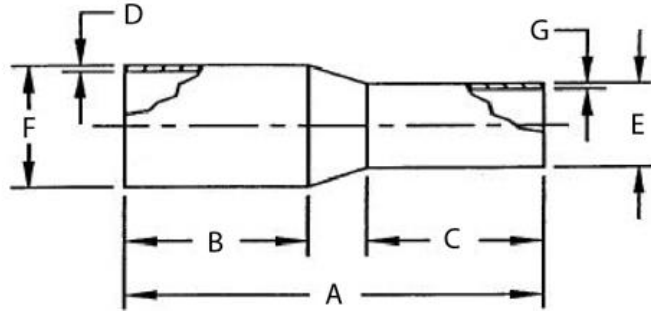
*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
3 x 2 IPS	7.87	3.94	2.95	0.206	2.375	3.500	0.140	0.45	100608	----
4 x 2 IPS	9.06	4.33	2.95	0.264	2.375	4.500	0.140	0.80	100612	----
4 x 3 IPS	9.06	4.33	3.94	0.264	3.500	4.500	0.206	1.05	100616	----
6 x 3 IPS	11.03	5.06	3.71	0.390	3.500	6.625	0.206	2.05	100620	----
6 x 4 IPS	11.42	5.12	4.33	0.390	4.500	6.625	0.264	2.55	100622	----
8 x 4 IPS	12.80	5.99	4.05	0.507	4.500	8.625	0.264	4.40	100626	----
8 x 6 IPS	12.80	6.10	5.12	0.507	6.625	8.625	0.390	5.05	100628	----
10 x 6 IPS	14.06	6.16	5.29	0.632	6.625	10.70	0.390	7.55	100632	----
10 x 8 IPS	14.37	6.25	5.81	0.632	8.625	10.70	0.507	9.15	100634	----
12 x 6 IPS	16.00	6.95	5.22	0.750	6.625	12.70	0.390	11.75	100636	----
12 x 8 IPS	16.54	7.09	6.10	0.750	8.625	12.70	0.507	13.45	100638	----
12 x 10 IPS	16.54	7.09	6.69	0.750	10.70	12.70	0.632	14.05	100640	----

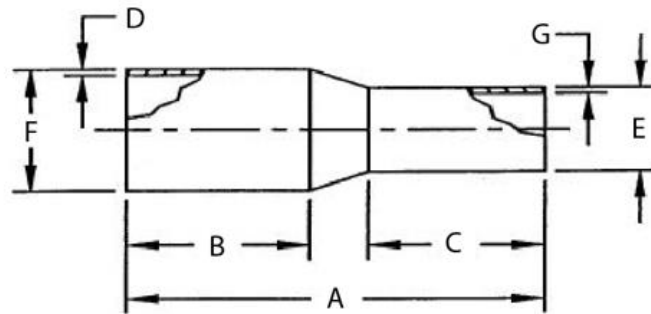


### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
1 x ¾ IPS	4.58	2.17	2.17	0.120	1.050	1.315	0.095	0.05	100600	-----
1 ¼ x 1 IPS	4.66	2.20	2.15	0.151	1.315	1.660	0.120	0.10	100601	-----
1 ½ x 1 IPS	5.12	2.44	2.16	0.173	1.315	1.900	0.120	0.15	100602	-----
1 ½ x 1 ¼ IPS	4.83	2.44	2.17	0.173	1.660	1.900	0.151	0.15	100603	-----
2 x 1 IPS	5.62	2.53	2.13	0.216	1.315	2.375	0.120	0.20	100604	-----
2 x 1 ¼ IPS	5.34	2.53	2.15	0.216	1.660	2.375	0.151	0.20	100605	-----
2 x 1 ½ IPS	5.40	2.53	2.42	0.216	1.900	2.375	0.173	0.25	100606	-----
3 x 2 IPS	7.87	3.94	2.95	0.318	2.375	3.500	0.216	0.50	100607	FM 200
4 x 2 IPS	9.06	4.33	2.95	0.409	2.375	4.500	0.216	1.25	100611	FM 200
4 x 3 IPS	9.06	4.33	3.94	0.409	3.500	4.500	0.318	1.15	100615	FM 200
6 x 3 IPS	11.03	5.06	3.71	0.602	3.500	6.625	0.318	3.15	100619	FM 200
6 x 4 IPS	11.42	5.12	4.33	0.602	4.500	6.625	0.409	3.75	100621	FM 200
8 x 4 IPS	12.80	5.99	4.05	0.784	4.500	8.625	0.409	6.70	100625	FM 200
8 x 6 IPS	12.80	6.10	5.12	0.784	6.625	8.625	0.602	7.70	100627	FM 200
10 x 6 IPS	14.06	6.16	5.29	0.977	6.625	10.75	0.602	11.55	100631	FM 200
10 x 8 IPS	14.37	6.95	5.88	0.977	8.625	10.75	0.784	13.40	100633	FM 200
12 x 6 IPS	16.00	6.95	5.22	1.159	6.625	12.75	0.602	17.15	100635	FM 200
12 x 8 IPS	16.54	7.09	6.10	1.159	8.625	12.75	0.784	19.41	100637	FM 200
12 x 10 IPS	16.54	7.09	6.69	1.159	10.75	12.75	0.977	21.30	100639	FM 200



### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

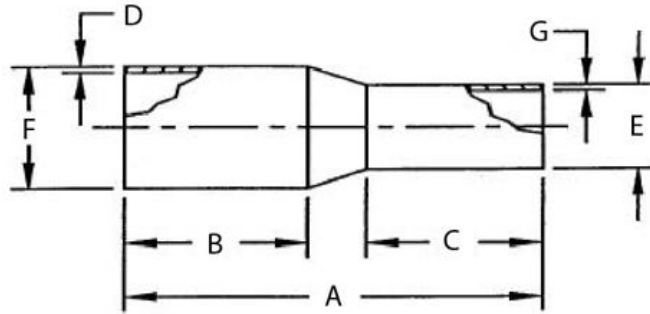
Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
3 x 2 IPS	7.87	3.94	2.95	0.389	2.375	3.500	0.264	0.75	100610	FM 250
4 x 2 IPS	9.06	4.33	2.95	0.500	2.375	4.500	0.264	1.40	100614	FM 250
4 x 3 IPS	9.06	4.33	3.94	0.500	3.500	4.500	0.389	1.45	100618	FM 250
6 x 4 IPS	11.42	5.12	4.33	0.736	4.500	6.625	0.500	3.80	100624	FM 250
8 x 6 IPS	12.80	6.10	5.12	0.958	6.625	8.625	0.736	8.80	100630	FM 250

### IPS

SDR 7 (standard dimension ratio)

355 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
3 x 2 IPS	7.87	3.94	2.95	0.500	2.375	3.500	0.339	1.00	100609	FM 335
4 x 2 IPS	9.06	4.33	2.95	0.643	2.375	4.500	0.339	1.75	100613	FM 335
4 x 3 IPS	9.06	4.33	3.94	0.643	3.500	4.500	0.500	2.10	100617	FM 355
6 x 4 IPS	11.42	5.12	4.33	0.946	4.500	6.625	0.643	5.20	100623	FM 335
8 x 6 IPS	12.80	6.10	5.12	1.232	6.625	8.625	0.946	10.65	100629	FM 355



## DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

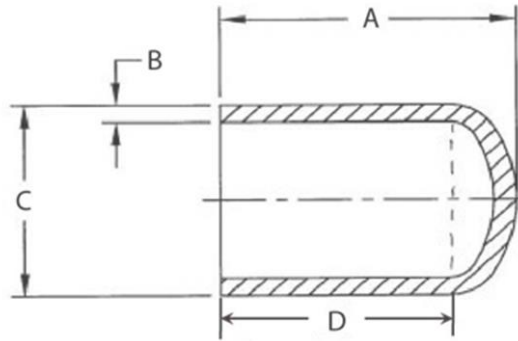
Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
6 x 4 DIPS	11.41	5.10	4.33	0.627	4.800	6.900	0.436	4.10	100641	FM 200
8 x 6 DIPS	12.79	6.10	5.12	0.823	6.900	9.050	0.627	7.80	100642	FM 200
10 x 6 DIPS	14.00	6.16	5.29	1.010	6.900	11.10	0.627		100643	-----
10 x 8 DIPS	14.37	6.25	5.88	1.010	9.050	11.10	0.823		100647	-----
12 x 6 DIPS	16.00	6.95	5.22	1.200	6.900	13.20	0.627		100651	-----
12 x 8 DIPS	16.54	7.09	6.10	1.200	9.050	13.20	0.823		100655	-----

## DIPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D (wall) [in.]	E (OD) [in.]	F (OD) [ins.]	G (wall) [ins.]	Weight [lbs.]	Item Code	FM Class
10 x 6 DIPS	14.06	6.16	5.29	1.01	6.90	11.1	0.627		100644	-----
10 x 8 DIPS	14.37	6.25	5.88	1.01	9.05	11.1	0.823		100648	-----
12 x 6 DIPS	16.00	6.95	5.22	1.20	6.90	13.2	0.627		100652	-----
12 x 8 DIPS	16.54	7.09	6.10	1.20	9.05	13.2	0.823		100656	-----



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	End Cap
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	3/4" - 12"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's</b>	17, 11, 9, 7

Manufactured and tested to meet requirements of: ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61  
 For use on pipe and fittings conforming to: ASTM D2513, ASTM D3035, ASTM F-714

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

## IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	0.140	2.375	2.52	0.10	100306	----
3" IPS	4.720	0.206	3.500	3.70	0.40	100310	----
4" IPS	5.310	0.264	4.500	3.98	0.70	100314	----
6" IPS	6.890	0.390	6.625	4.84	2.00	100318	----
8" IPS	8.660	0.507	8.625	5.83	4.20	100322	----
10" IPS	9.840	0.633	10.75	6.30	7.50	100326	----
12" IPS	11.77	0.750	12.75	7.52	12.4	100328	----

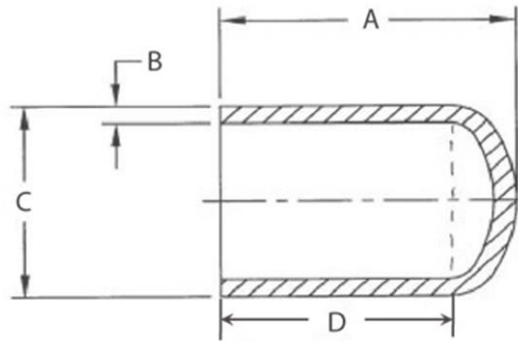
## IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
3/4" IPS	2.550	0.095	1.050	2.18	0.10	100300	----
1" IPS	2.640	0.120	1.315	2.18	0.10	100302	----
1 1/4" IPS	2.770	0.151	1.660	2.18	0.10	100303	----
1 1/2" IPS	3.100	0.173	1.900	2.42	0.70	100304	----
2" IPS	3.230	0.216	2.375	2.52	0.80	100305	FM 200
3" IPS	4.720	0.318	3.500	3.70	0.90	100309	FM 200
4" IPS	5.310	0.409	4.500	3.98	1.10	100313	FM 200
6" IPS	6.890	0.603	6.625	4.84	2.90	100317	FM 200
8" IPS	8.660	0.785	8.625	5.83	6.30	100321	FM 200
10" IPS	9.840	0.978	10.75	6.30	10.9	100325	FM 200
12" IPS	11.77	1.160	12.75	7.52	18.4	100327	FM 200





## IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

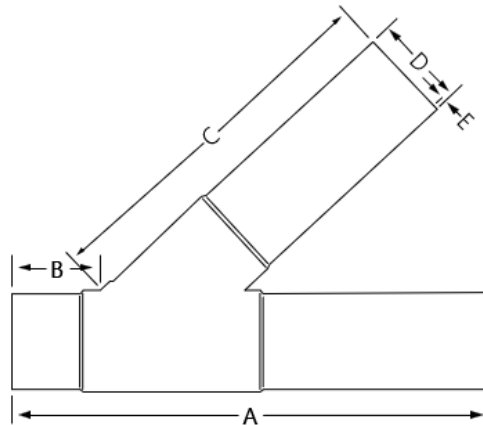
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	0.264	2.375	2.52	0.3	100308	FM 250
3" IPS	4.720	0.389	3.500	3.70	0.8	100312	FM 250
4" IPS	5.310	0.500	4.500	3.98	2.4	100316	FM 250
6" IPS	6.890	0.736	6.625	4.84	2.8	100320	FM 250
8" IPS	8.660	0.958	8.625	5.83	5.6	100324	FM 250

## IPS

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	3.230	0.339	2.375	2.52	0.3	100307	FM 335
3" IPS	4.720	0.500	3.500	3.70	1.0	100311	FM 335
4" IPS	5.310	0.643	4.500	3.98	2.4	100315	FM 335
6" IPS	6.890	0.946	6.625	4.84	2.8	100319	FM 335
8" IPS	8.660	1.232	8.625	5.83	5.6	100323	FM 335



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	45° Wye
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 8"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

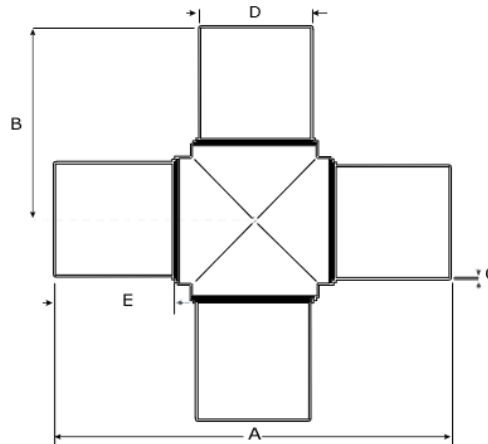
Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	23.74	5.28	13.10	2.375	0.140	2.10	100901	-----
3" IPS	24.56	5.90	13.10	3.500	0.206	3.00	100903	-----
4" IPS	28.50	5.70	20.60	4.500	0.264	7.00	100905	-----
6" IPS	34.65	5.30	26.00	6.625	0.390	19.8	100907	-----
8" IPS	37.40	5.70	27.56	8.625	0.507	44.9	100909	-----

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	23.74	5.28	13.10	2.375	0.216	2.20	100900	-----
3" IPS	24.56	5.90	13.10	3.500	0.318	4.70	100902	-----
4" IPS	28.50	5.70	20.60	4.500	0.409	9.70	100904	-----
6" IPS	34.65	5.30	26.00	6.625	0.603	26.2	100906	-----
8" IPS	37.40	5.70	27.56	8.625	0.785	52.0	100908	-----



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	4-Way Cross
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 4"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

## IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	8.96	4.45	0.140	2.375	2.64	0.7	100771	-----
3" IPS	11.81	5.90	0.206	3.500	3.54	1.8	100775	-----
4" IPS	13.98	6.89	0.264	4.500	3.94	3.2	100779	-----

## IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	8.96	4.45	0.216	2.375	2.64	1.0	100770	-----
3" IPS	11.81	5.90	0.318	3.500	3.54	1.9	100774	-----
4" IPS	13.98	6.89	0.409	4.500	3.94	4.4	100778	-----

## IPS

SDR 9 (standard dimension ratio)

250 PSI (MAOP @ 73.4° F)

Nominal Size	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	8.96	4.45	0.264	2.375	2.64	1.1	100773	-----
3" IPS	11.81	5.90	0.389	3.500	3.54	2.8	100777	-----
4" IPS	13.98	6.89	0.500	4.500	3.94	5.3	100781	-----

## Limited Product Warranty

Integrity Fusion Products, Inc. warrants its materials to be free of defects in workmanship under normal use and service, when used for purposes under the conditions for which they are intended for a period of one (1) year.

*This warranty shall not apply to any Integrity Fusion Products, Inc. material that has been altered, repaired and/or used in any way, stored outside, or has been subject to misuse, negligence, accident and/or has not been installed in accordance with installation instructions.*

*This warranty does not cover labor or other costs of installing or repairing the products. Buyer's sole remedy for defective product shall be to receive replacement product as provided in this Limited Warranty. Seller's liability arising out of or related to the product supplied by Integrity Fusion Products shall in no event exceed the original price of the defective product. Seller will not be liable for any consequential, incidental, special, indirect or punitive damages, loss of profits, loss of business opportunity or other loss even if seller knew or should have known of the possibility of such damages or losses. Buyer shall assume all responsibility and expenses for removal, reinstallation and freight charges in connection with the foregoing remedy.*

*Integrity Fusion Products, Inc. shall not be held liable for any delays caused by shipping any material or equipment by third party shipping companies. Integrity Fusion Products, Inc. shall not be responsible for any delays caused by shipping errors of material and/or equipment.*

*Any claim regarding shortage or damages from shipment of material must be submitted in writing to Integrity Fusion Products, Inc within 7 days after receipt of shipment. Buyer shall note loss or damage on shipment Bill of Lading and provide a delivery receipt stating such with driver's signature. Loss or damages to materials in transit is the responsibility of the carrier*

*The buyer must comply with the standard warranty investigation procedures for Integrity Fusion Products which includes providing sample of the product in question and completing Integrity Fusion Products Investigation Report Form. Failure to provide needed and required information and samples for investigation purposes will result in the limited warranty being null and void.*

### General Electrofusion Requirements

*Installation of electrofusion fittings requiring 42V-48V must be carried out using an IntegriFuse or I Fuse 105 Electrofusion processor. For IntegriFuse Electrofusion fittings requiring an amperage of over 80 amps, the IntegriFuse I Fuse 105 Electrofusion Processor is required.*

*The I Fuse 105 Electrofusion processor is an 8-48-volt output multi-voltage fusion processor with temperature compensating feature operating at 220/230 VAC requiring power supplied through a portable power generator rated at the necessary continuous watts.*

*If the pipe is out of round the use of a Re-Round Clamp is required to ensure proper installation.*

*Improper scraping, cleaning, and alignment of pipe during the installation procedures results in limited warranty being null and void.*

*Electrofusion Installation instructions must be adhered to or our Limited Warranty is null and void. Installation of electrofusion fittings must be carried out by properly trained and qualified operator(s). Large diameter fittings require certification by Integrity Fusion Products, Inc.*

### Integrifuse Valve

*The Limited Warranty shall apply only to operations which fall under the guidelines of conditions in which the valve was designed for and for applications of normal use. The limited liability will be null and void in the case that the valve failure was caused by excessive operating or surge pressure, introduction of any chemicals or acids that cause degradation to the seats or stem, excessive water hammer, introduction of abrasives such as sand and or grit, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted), hot soil conditions, excessive temperature.*

### Integrifuse Butt Fusion Fittings

*The Limited Warranty shall apply only to operations which fall under the guidelines of conditions in which the butt fusion fitting was designed for and for applications of normal use. The limited liability will be null and void in the case that the fitting failure was caused by excessive operating or surge pressure, excessive water hammer, introduction of abrasives such as sand and or grit that have cause abrasion of the fitting, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted). This warranty does not cover failure resulting from improper fusion by the installer.*

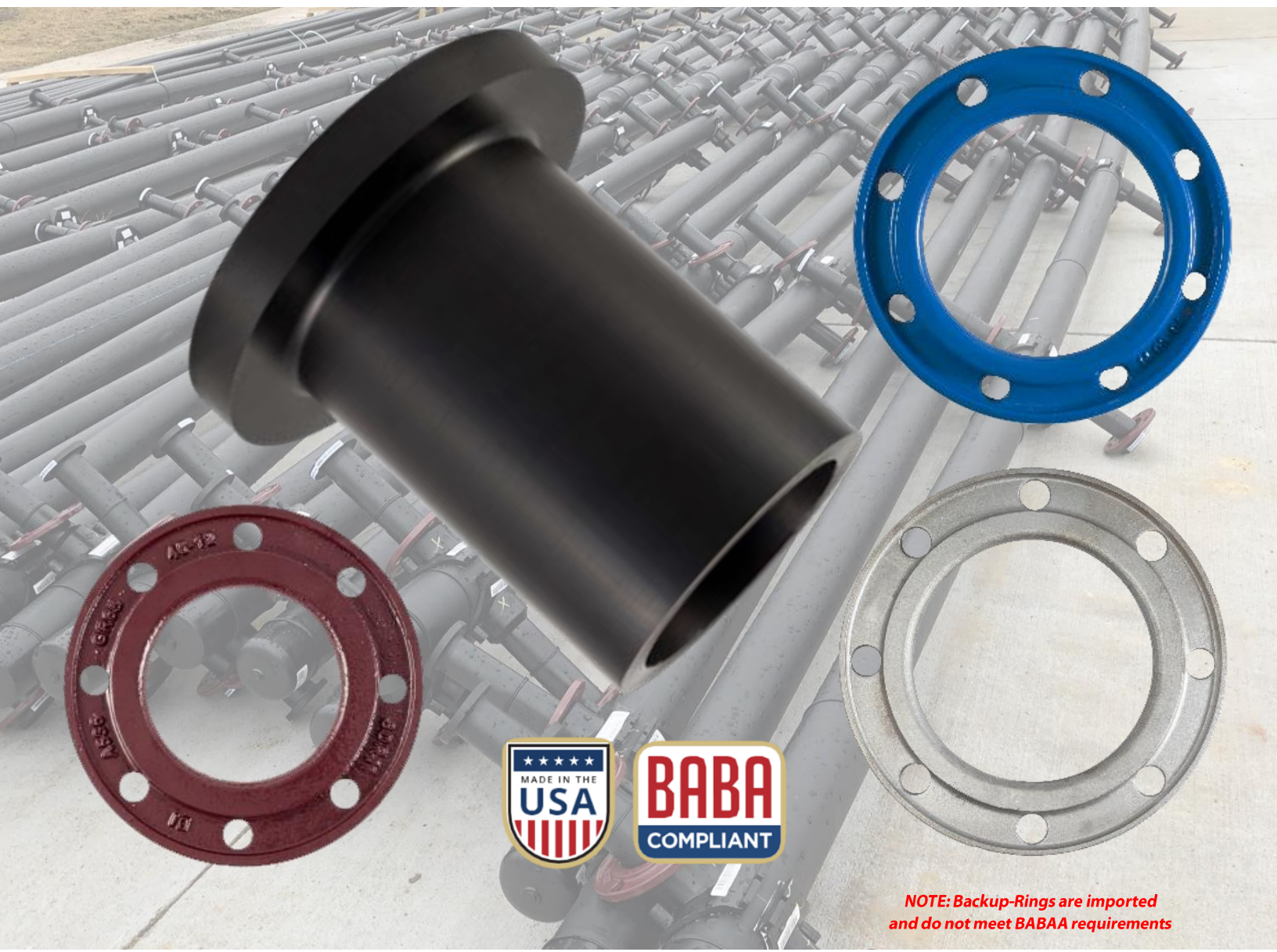
Purchaser is responsible for passing on this Limited Warranty to their customer.

The logo features a stylized green circular emblem composed of concentric, slightly offset rings, resembling a globe or a signal. To the right of this emblem, the word "INTEGRITY" is written in a large, bold, black serif font. Below "INTEGRITY", the words "Fusion Products, Inc." are written in a smaller, black serif font.

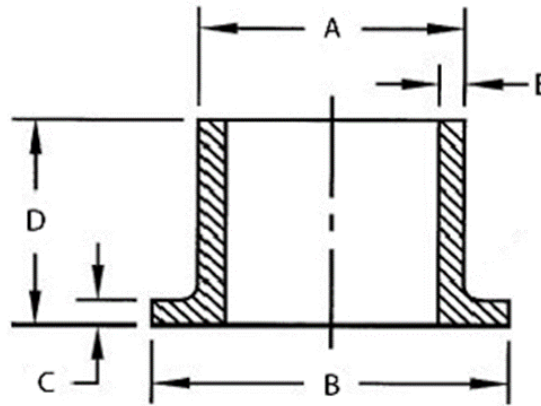
# INTEGRITY Fusion Products, Inc.

## Injection Molded Flange Adapters & Back-Up Rings

**Integrity Fusion Products** offers a full line of injection molded **IPS** and **DIPS** Non-Beveled HDPE Flange Adapters, and a growing line of 60° Beveled Flange Adapters for butterfly valves; and, a full line of **Fusion Bonded Epoxy Coated Ductile Iron Back-Up Rings**, and class 150 316 Stainless Steel Back-Up Rings that are manufactured in a variety of nominal pipe sizes and SDR's. **Molded HDPE Flange Adapters** from Integrity Fusion Products in our manufacturing facility located in Peachtree City, GA; are manufactured and tested to meet the requirements of ASTM D2513, ASTM D3261, and ANSI/AWWA C901 and C906 for use with outside diameter-controlled pipe and fittings conforming to ASTM D2513, ASTM D3035, and ASTM F-714. All **Back-Up Rings** are manufactured to comply to the drilling and mating requirements in **ANSI/ASME B16.5** and **AWWA C207** for use in applications 24" and smaller; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications 26" and larger.



**NOTE: Backup-Rings are imported  
and do not meet BABAA requirements**



<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Flange Adapter
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 36"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	17, 11, 9, 7
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

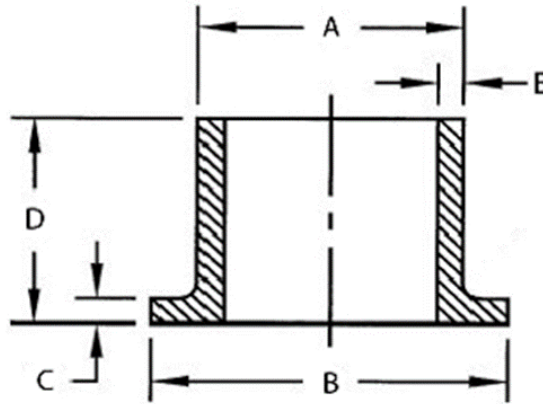
*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4° F)

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.40	5.710	0.140	0.30	100401	-----
3" IPS	3.500	5.000	0.42	5.820	0.206	0.55	100405	-----
4" IPS	4.500	6.000	0.54	6.540	0.265	1.10	100409	-----
6" IPS	6.625	8.500	0.80	8.000	0.390	2.75	100413	-----
8" IPS	8.625	10.63	1.02	9.020	0.507	5.50	100417	-----
10" IPS	10.75	12.75	1.29	10.01	0.632	9.10	100421	-----
12" IPS	12.75	15.00	1.55	10.75	0.750	13.55	100424	-----
14" IPS	14.00	17.50	1.62	12.00	0.824	20.00	100427	-----
16" IPS	16.00	20.00	1.85	12.00	0.941	26.00	100429	-----
18" IPS	18.00	21.12	2.08	12.00	1.059	30.00	100431	-----
20" IPS	20.00	23.50	2.31	12.00	1.176	38.00	100433	-----
24" IPS	24.00	28.00	2.77	14.00	1.412	66.00	100437	-----



### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

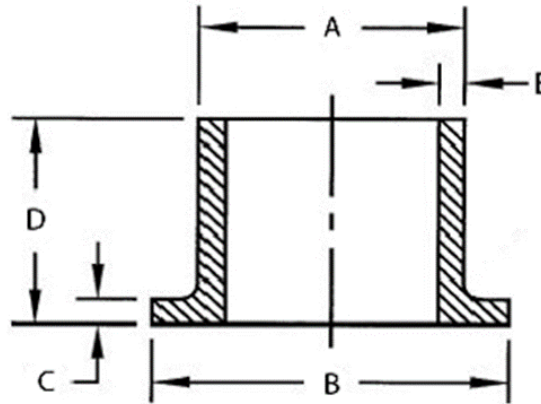
Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.40	5.710	0.126	0.50	100400	FM 200
3" IPS	3.500	5.000	0.42	5.820	0.318	0.55	100404	FM 200
4" IPS	4.500	6.000	0.54	6.540	0.409	1.50	100408	FM 200
6" IPS	6.625	8.500	0.80	8.000	0.602	3.95	100412	FM 200
8" IPS	8.625	10.63	1.02	9.020	0.784	7.40	100416	FM 200
10" IPS	10.75	12.75	1.29	10.01	0.977	12.80	100420	FM 200
12" IPS	12.75	15.00	1.55	10.75	1.159	19.60	100423	FM 200
14" IPS	14.00	17.50	1.62	12.00	1.273	27.00	100426	-----
16" IPS	16.00	20.00	1.85	12.00	1.455	36.00	100428	-----
18" IPS	18.00	21.12	2.08	12.00	1.636	42.00	100430	-----
20" IPS	20.00	23.50	2.31	12.00	1.818	54.00	100432	-----
24" IPS	24.00	28.00	2.77	14.00	2.182	91.00	100436	-----

### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.55	6.10	0.264	0.50	100403	FM 250
3" IPS	3.500	5.000	0.67	6.10	0.389	1.15	100407	FM 250
4" IPS	4.500	6.610	0.79	6.10	.0500	2.05	100411	FM 250
6" IPS	6.625	8.500	1.02	8.07	0.736	TBD	100415	FM 250
8" IPS	8.625	10.63	1.02	10.67	0.958	TBD	100419	FM 250
10" IPS	10.75	12.99	1.18	11.50	1.194	TBD	Coming Soon	-----
12" IPS	12.75	15.75	1.38	10.83	1.417	TBD	Coming Soon	-----



### IPS

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.55	6.10	0.339	0.65	100402	FM 335
3" IPS	3.500	5.000	0.67	6.10	0.500	1.30	100406	FM 335
4" IPS	4.500	6.610	0.79	6.10	0.643	2.25	100410	FM 335
6" IPS	6.625	8.500	1.02	8.07	0.946	5.95	100414	FM 335
8" IPS	8.625	10.63	1.63	18.68	1.232	11.00	100418	FM 335

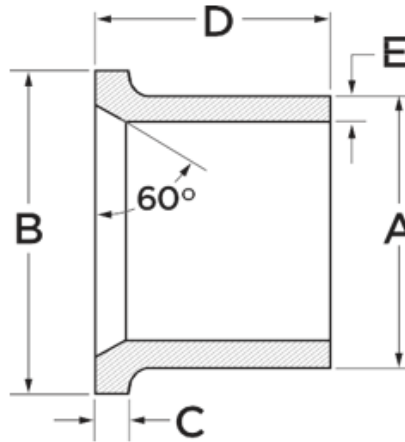
### DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
4" DIPS	4.800	6.560	0.68	6.00	0.436	1.65	100446	FM 200
6" DIPS	6.900	8.600	1.00	8.00	0.627	4.35	100447	FM 200
8" DIPS	9.050	10.72	1.25	9.00	0.823	8.00	100448	FM 200
10" DIPS	11.10	12.15	1.35	9.00	1.009	12.20	100449	FM 200
12" DIPS	13.20	15.94	1.81	10.78	1.200	20.075	100450	FM 200





<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	Flange Adapter
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 4"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b>		ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

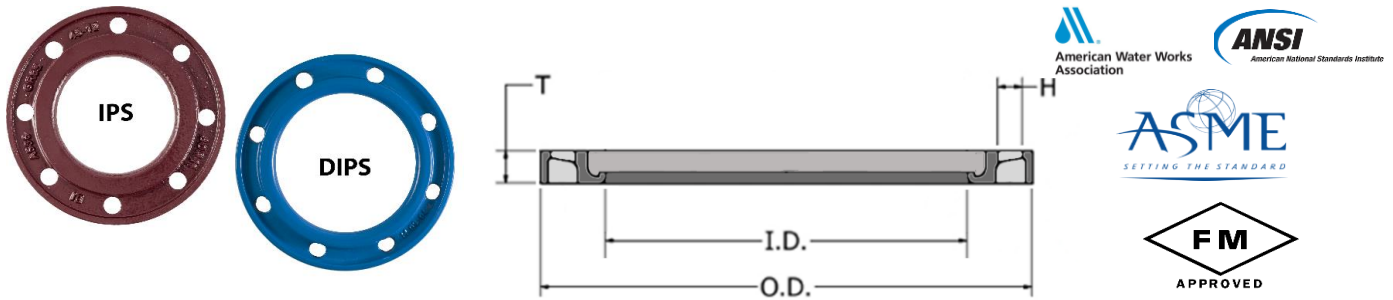
*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	A (OD) [in.]	B [in.]	C [in.]	D (length) [in.]	E (wall) [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	3.940	0.57	6.00	0.216	0.50	100470	-----
3" IPS	3.500	5.000	0.76	6.00	0.318	1.00	100472	-----
4" IPS	4.500	6.000	1.17	6.80	0.409	2.15	100474	-----
6" IPS	6.625	8.500	1.39	8.00	0.946	TBD	100476	-----
8" IPS	8.625	10.60	1.82	9.00	1.232	TBD	100478	-----
10" IPS	10.75	12.80	2.24	10.75	1.536	TBD	100480	-----
12" IPS	12.75	15.25	2.55	11.00	1.821	TBD	100482	-----



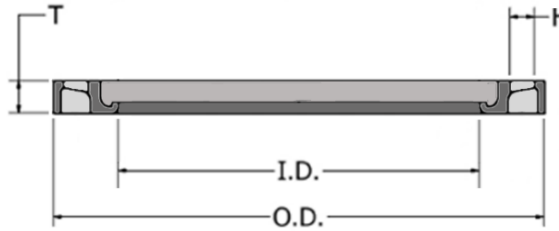
Integrity Fusion Products offers a line of **Convuluted Ductile Iron Backup Rings** manufactured from **ASTM A536 grade 65-45-12** material and are available in a variety of nominal **IPS** and **DIPS** HDPE pipe diameters and SDR ratings. Our **Convuluted Ductile Iron Backup Rings** are designed and manufactured to comply to the drilling and mating requirements in **ANSI/ASME B16.5** and **AWWA C207** for use in applications *24" and smaller*; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications *26" and larger*. Our **Fusion Bonded Epoxy Coating** offers superior long-term corrosion resistance characteristics over the industry standard Red Oxide primer, or painted epoxy coatings which tend to chip and rust shortly after installation, and as a visual convenience to our customers, our Epoxy Coated Backup Rings are **color coded** as follows: Red indicates an IPS size, and Blue indicates a DIPS size. All Integrity Fusion Ductile Iron Backup Rings, 12" and smaller, have been FM tested and approved. SDR 11 Backup Rings meet all FM 200 requirements, and SDR 7 – 9 Backup rings all meet FM 335 requirements.

## IPS

### SDR 11 (Epoxy Coated Ductile Iron Backup Ring)

### 200 PSI Class 150# Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
2" IPS	6.00	2.60	0.50	4	0.75	1.80	100200	FM 200
3" IPS	7.50	3.75	0.53	4	0.75	2.80	100202	FM 200
4" IPS	9.00	4.75	0.55	8	0.75	3.80	100204	FM 200
6" IPS	11.00	6.88	0.63	8	0.88	5.60	100206	FM 200
8" IPS	13.50	8.88	0.85	8	0.88	9.80	100208	FM 200
10" IPS	16.00	11.00	0.98	12	1.00	13.30	100210	FM 200
12" IPS	19.00	13.15	1.25	12	1.00	22.30	100212	FM 200
14" IPS	21.00	14.40	1.38	12	1.13	31.00	100214	-----
16" IPS	23.50	16.40	1.65	16	1.13	42.00	100216	-----
18" IPS	25.00	18.34	1.67	16	1.25	45.00	100218	-----
20" IPS	27.50	20.50	1.81	20	1.25	58.00	100220	-----
24" IPS	32.00	24.50	2.17	20	1.38	86.00	100222	-----
28" IPS	36.50	28.60	2.50	28	1.38	113.0	100224	-----
30" IPS	38.75	30.60	2.60	28	1.38	141.0	100226	-----
32" IPS	41.75	32.60	2.75	28	1.63	161.0	100227	-----
36" IPS	46.00	36.60	3.15	32	1.63	217.0	100228	-----



## IPS

SDR 7 (Epoxy Coated Ductile Iron Backup Rings)

355 PSI Class 150 # Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
2" IPS	6.00	2.60	0.75	4	0.75	2.50	100201	FM 335
3" IPS	7.50	3.75	0.85	4	0.75	4.00	100203	FM 335
4" IPS	9.00	4.75	0.92	8	0.75	5.70	100205	FM 335
6" IPS	11.00	6.88	1.00	8	0.88	8.30	100207	FM 335
8" IPS	13.50	8.88	1.12	8	0.88	11.4	100209	FM 335
10" IPS	16.00	11.00	1.22	12	1.00	16.2	100211	FM 335
12" IPS	19.00	13.15	1.48	12	1.00	26.5	100213	FM 335
14" IPS	21.00	14.40	1.62	12	1.13	37.0	100215	-----
16" IPS	23.50	16.40	1.82	16	1.13	50.0	100217	-----
18" IPS	25.00	18.34	1.82	16	1.25	51.0	100219	-----
20" IPS	27.50	20.50	2.00	20	1.25	37.0	100221	-----
24" IPS	32.00	24.50	2.18	20	1.38	96.0	100223	-----

For use in SDR 9 applications @ 255 PSI

For use in SDR 7 applications @ 355 PSI

## DIPS

SDR 11 (Epoxy Coated Ductile Iron Backup Ring)

200 PSI Class 150# Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
4" DIPS	9.00	5.00	0.55	8	0.75	3.80	100260	FM 200
6" DIPS	11.00	7.10	0.63	8	0.88	5.10	100261	FM 200
8" DIPS	13.50	9.20	0.85	8	0.88	8.50	100262	FM 200
10" DIPS	16.00	11.30	0.98	12	1.00	13.60	100263	FM 200
12" DIPS	19.00	13.45	1.25	12	1.00	22.50	100264	FM 200

## DIPS

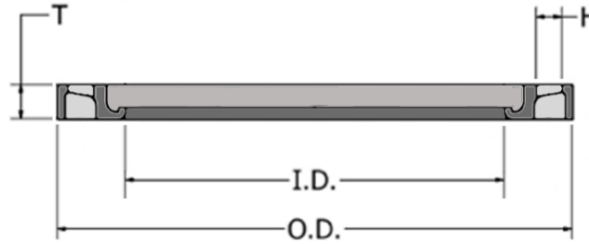
SDR 7 (Epoxy Coated Ductile Iron Backup Ring)

355 PSI Class 150# Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
4" DIPS	9.00	5.00	0.94	8	0.75	6.20	100229	FM 335
6" DIPS	11.00	7.10	1.00	8	0.88	8.40	100230	FM 335
8" DIPS	13.50	9.20	1.12	8	0.88	12.3	100231	FM 335
10" DIPS	16.00	11.30	1.19	12	1.00	17.7	100232	FM 335
12" DIPS	19.00	13.45	1.50	12	1.00	29.3	100233	FM 335

For use in SDR 9 applications @ 255 PSI

For use in SDR 7 applications @ 355 PSI



Integrity Fusion Products offers a line of class 150 **Convuluted Stainless Steel Backup Rings** manufactured from **ASTM A351CF8M (316) 70/30/30** material and are available in a variety of nominal **IPS** and **DIPS** HDPE pipe diameters and SDR ratings up to 24". For sizes 28" to 36", we offer **ASTM A351CF8M (316) 70/30/30 Flat Plate Style Backup Rings**. Integrity Fusion Products **Stainless Steel Backup Rings** are designed and manufactured to comply with the drilling and mating requirements set forth in **ANSI/ASME B16.5** and **AWWA C207** for use in applications *24" and smaller*; and with **ANSI/ASME B16.47** and **AWWA C207** for use in applications *26" and larger*. All Integrity Fusion Stainless Steel Backup Rings, 12" and smaller, have been FM tested and approved. SDR 11 Backup Rings meet all FM 200 requirements, and SDR 7 – 9 Backup rings all meet FM 335 requirements.

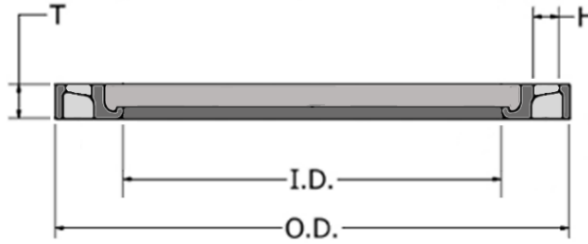
## IPS

### SDR 11 (316 Stainless Steel Backup Ring)

### 200 PSI Class 150# Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
2" IPS	6.00	2.64	0.45	4	0.75	1.70	100241	FM 200
3" IPS	7.50	3.75	0.53	4	0.75	2.60	100242	FM 200
4" IPS	9.00	4.80	0.55	8	0.75	3.80	100243	FM 200
6" IPS	11.00	6.90	0.63	8	0.88	5.50	100244	FM 200
8" IPS	13.50	8.90	0.85	8	0.88	9.50	100245	FM 200
10" IPS	16.00	11.00	0.99	12	1.00	13.9	100246	FM 200
12" IPS	19.00	13.15	1.26	12	1.00	16.6	100247	FM 200
14" IPS	21.00	14.42	1.38	12	1.13	33.0	100248	-----
16" IPS	23.50	16.47	1.57	16	1.13	44.0	100249	-----
18" IPS	25.00	18.50	1.65	16	1.25	48.0	100250	-----
20" IPS	27.50	20.50	1.85	20	1.25	63.0	100252	-----
24" IPS	32.00	24.60	2.18	20	1.38	98.0	100253	-----
28" IPS (**)	36.42	28.66	2.76	28	1.42	277.8	100265	-----
30" IPS (**)	38.78	30.67	2.87	28	1.42	327.5	100266	-----
32" IPS (**)	41.73	32.52	-----	28	1.63	204.6	100267	-----
34" IPS (**)	43.74	34.53	-----	32	1.63	224.9	100268	-----
36" IPS (**)	46.06	36.81	3.50	32	1.65	520.0	100269	-----

**\*\* Double asterisk shows the Backup Ring is a flat plate design**



## IPS

SDR 7 - 9 (316 Stainless Steel Backup Ring)

Class 150 # Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
4" IPS	9.00	4.75	0.72	8	0.75	6.000	100272	FM 335
6" IPS	11.00	6.88	0.76	8	0.88	8.550	100273	FM 335
8" IPS	13.50	8.88	0.83	8	0.88	12.65	100274	FM 335
10" IPS	16.00	11.00	0.95	12	1.00	19.55	100275	FM 335
12" IPS	19.00	13.15	1.22	12	1.00	34.55	100276	FM 335

For use in SDR 9 applications @ 255 PSI

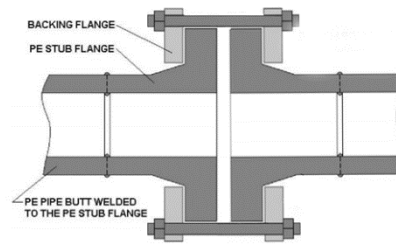
For use in SDR 7 applications @ 355 PSI

## DIPS

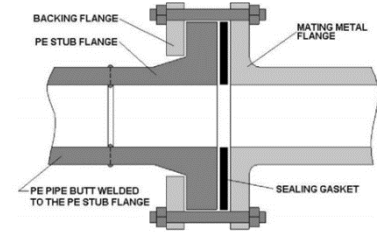
SDR 11 (316 Stainless Steel Backup Ring)

200 PSI Class 150# Bolt Pattern

Nominal Size	OD (in.)	ID (in.)	Thickness (in.)	# Bolt Holes	Hole Dia. (ins)	Weight [lbs.]	Item Code	FM Class
4" DIPS	9.00	5.00	0.55	8	0.75	3.80	100254	FM 200
6" DIPS	11.00	7.10	0.63	8	0.88	5.50	100255	FM 200
8" DIPS	13.50	9.20	0.85	8	0.88	10.0	100256	FM 200
10" DIPS	16.00	11.30	0.98	12	1.00	14.1	100257	FM 200
12" DIPS	19.00	13.45	1.25	12	1.00	24.2	100258	FM 200



HDPE Flange to HDPE Flange



HDPE Flange to Metal Flange

The Flange Adapter is a high-density polyethylene fitting that allows you to make a mechanical transition to or from a **polyethylene-to-polyethylene** system or a **polyethylene to non-polyethylene** system by use of a standard ANSI/AWWA Backup Ring (*also known as a metal lap joint flange*).

To make this kind of connection you need to have on-hand, a **Flange Adapter**, (2) **Backup Rings or a flanged appurtenance**, and a **bolt set**. The neck of the Flange Adapter is sufficiently long enough so that it can be clamped in a fusion machine or electrofused onto a polyethylene pipe end, but the Backup Ring will need to be placed loosely on the Flange Adapter prior to being fused on the pipe.

### Flange Assembly Methods

There are two methods commonly used when making the Flange Adapter connection between various combinations of pipe materials such as HDPE to HDPE; HDPE to Steel; HDPE to Ductile Iron; HDPE to PVC; HDPE to Fiberglass.

- **Non-Gasketed Method**, uses the specified HDPE seating torque initially applied to the HDPE Flange Adapters, followed by a mandatory re-torque applied 4 – 24 hours after completion of the torque application.
- **Gasketed Method**, uses a low gasket seating bolt torque, applied to a soft elastomeric gasket, for lower pressure applications (like landfill gas collection or use with torque limited PVC or fiberglass flanges), followed by the mandatory re-torque 4 – 24 hours later.

### Flange Gaskets

**Gaskets are not usually needed for properly torqued self-gasketing HDPE flange assemblies.** However, gaskets may be needed for applications working at higher pressures or for connections being made between a polyethylene flange and non-polyethylene flanges.

*NOTE: IF gaskets are to be used, the gasket materials should be chemically and thermally compatible with the internal fluid and the external environment. They should be of proper hardness, thickness, and style. They should also be recommended by the gasket manufacturer for use with polyethylene flanges. Upon seating, a gasket must be capable of overcoming minor alignment and flange imperfections such as non-parallel flanges, distortion troughs/grooves, surface waviness. Or surface scoring.*

*When gaskets harder than HDPE are used, the hard gasket seating stress may be more than the HDPE seating stress. When higher seating stress gaskets are used with mating metal flanges, the HDPE may seat on its side of the gasket but may not be able to seat the harder gasket into the metal on the other metal flange face. Hence, there is a limit on the gasket seating stress when other material gaskets are used.*

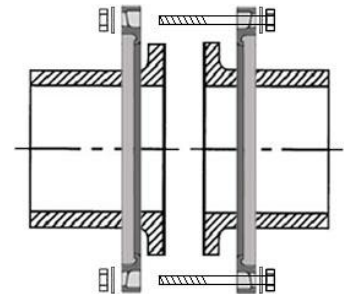
### Flange Assembly

- Before fitting the flange assembly, lubricate the flange bolt threads, washers and nuts with a non-fluid lubricant grease.
- Flange surfaces, and gasket surfaces if being used, must be clean and free of cut or gouges.
- Fit the flange components together loosely.
- Tighten bolts by hand and recheck alignment.
- Adjust alignment if necessary.
- Flange bolts should be tightened to the proper torque value (see Table 1) by turning the nut.
- Tighten the flange nuts according to the sequential numbered patterns provided (see Figure 1).
- Tighten all the bolts in the sequential pattern before changing to a higher torque value.
- Establish a sealing surface pressure by tightening the bolts to a torque value of 5 ft-lbs., then increase torque increments to about 15 ft-lbs. or less.
- Tighten bolts to the torque value recommended.

**Caution** – Mating flanges must be aligned to each other before tightening. Tightening misaligned flanges can cause leakage or flange failure. Do not try to align flange faces by tightening bolts.

**Caution** – Improperly assembled flange connections may leak. The assembly for polyethylene flange connections is different from assembly of metallic flange connections. It is important that the installer be aware of the differences. Retightening is essential in achieving a seal.

**Caution** – Retightening. Polyethylene and the gasket (if used) will undergo compression set that may loosen the bolts. About an hour or so after the final tightening, retighten each flange bolt nut to the final torque value. As before, retighten in the correct pattern sequence and in increments of 15 ft-lbs. or less. For flange adapters 12" and smaller, a second retightening after 4 hours is recommended. For flange adapters larger than 12", the second retightening is recommended after 12 to 24 hours.



### Flange Bolts

Flange bolts are typically sized 1/8" smaller than the bolt hole diameter and mating flanges are usually joined together with Hex-head bolts, flat washers and hex nuts, or threaded studs, flat washers and hex nuts. Generally Hex-head and stud bolts are SAE Grade 2 or ASTM A307 Grade B when used to join flanges with rubber gaskets. When using non-rubber gaskets or when using Class 300 backup rings, higher strength bolts may be needed to provide sufficient clamping force to seal the gaskets. Check with the gasket supplier. Flange bolts must span the entire width of the flange joint and provide sufficient thread length to engage the nut. Flat washers should be used between the nut and the backup ring.

Because the length of bolt is heavily dependent on the specific application, and the type of flanged fitting or appurtenance being bolted to – standard bolt lengths are difficult to provide, and in many applications **All-Thread** is used in the place of the Hex Head Bolts.

Flange Size	Flange SDR	HDPE to HDPE		HDPE to 150# Flange		Bolt Dia.	Bolt TPI	Stud or Bolt Qty.	Washer Qty.	Socket Size	
		Hex Bolt Length	150# Stud Length	Hex Bolt Length	150# Stud Length					Std Head	Heavy Head
2"	17	3 -1/2"	3 -1/2"	2-3/4"	3-1/4"	5 / 8"	11	4	8	15/16"	1-1/16"
	11										
3"	17	3 -1/2"	3-7/8"	3-1/4"	3-3/4"	5 / 8"	11	4	8	15/16"	1-1/16"
	11										
4"	17	4"	4-1/2"	3-1/2"	4"	5 / 8"	11	8	16	15/16"	1-1/16"
	11										
6"	17	4-1/4"	4-3/4"	3-3/4"	4-1/4"	3 / 4"	10	8	16	1-1/8"	1-1/4"
	11										
8"	17	4-3/4"	5-1/4"	4-1/4"	4-5/8"	3 / 4"	10	8	16	1-1/8"	1-1/4"
	11										
10"	17	5-1/2"	5-7/8"	4-3/4"	5-1/4"	7 / 8"	9	12	24	1-5/16"	1-7/16"
	11	6-1/4"	6-5/8"	5"	5-1/2"						
12"	17	6-1/4"	6-5/8"	5"	5-1/2"	7 / 8"	9	12	24	1-5/16"	1-7/16"
	11	7-1/4"	7-5/8"	5-1/2"	6"						
14"	17	6-3/4"	7-1/4"	5-3/4"	6-1/4"	1"	8	12	24	1-1/2"	1-5/8"
	11	8"	8-1/2"	6-1/4"	6-3/4"						
16"	17	7-1/2"	8"	6"	6-1/2"	1"	8	16	32	1-1/2"	1-5/8"
	11	9"	9-1/2"	6-3/4"	7-1/4"						
18"	17	8 1/4"	8-5/8"	6-3/4"	7-1/4"	1-1/8"	8	16	32	1-1/16"	1-13/16"
	11	9-7/8"	10"	7-1/2"	7-7/8"						
20"	17	8-7/8"	9-1/4"	7"	7-1/2"	1-1/8"	8	20	40	1-1/16"	1-13/16"
	11	10-1/4"	10-3/4"	7-3/4"	8-1/4"						
24"	17	10-1/8"	10-5/8"	8"	8-1/2"	1-1/4"	8	20	40	1-7/8"	2"
	11	12-1/2"	12-7/8"	9-1/4"	9-3/4"						

**NOTICE: This list of bolt lengths is a general guideline to be used for reference purposes only. The lengths given in this list are based on general industry information and may not be appropriate for your specific application.**

### Bolt Tightening

**Multiple rounds of tightening should be used to ensure uniform bolt tightness.**

After hand-tightening, a minimum of **three (3) rounds of incremental tightening** is suggested, tightening to approximately **30%** of the target torque value on the first round. Tighten to **50-70%** on the second round, and to **100%** on the third round.

After the third round, it is recommended that all the bolts should be checked and retorqued to 100% in a circular pattern to ensure that no bolts were inadvertently missed during the tightening sequence. Bolt tightening torque values are provided in **Table 1** and are typically sufficient for obtaining a seal. However, if using a gasket, bolts should be tightened to the gasket manufacturers recommended torque for the selected gasket and the application conditions.

The effectiveness of the seal is strongly dependent on field assembly technique. Over tightening rubber gaskets may damage or extrude the gasket. Under tightening could result in blow outs or leakage. Flange connections should be left exposed until leak testing is complete.

*NOTE: There are conditions that can affect proper bolt tightening. These include bolt thread condition, thread cleanliness, earlier usage of bolts, lubricants and weather.*



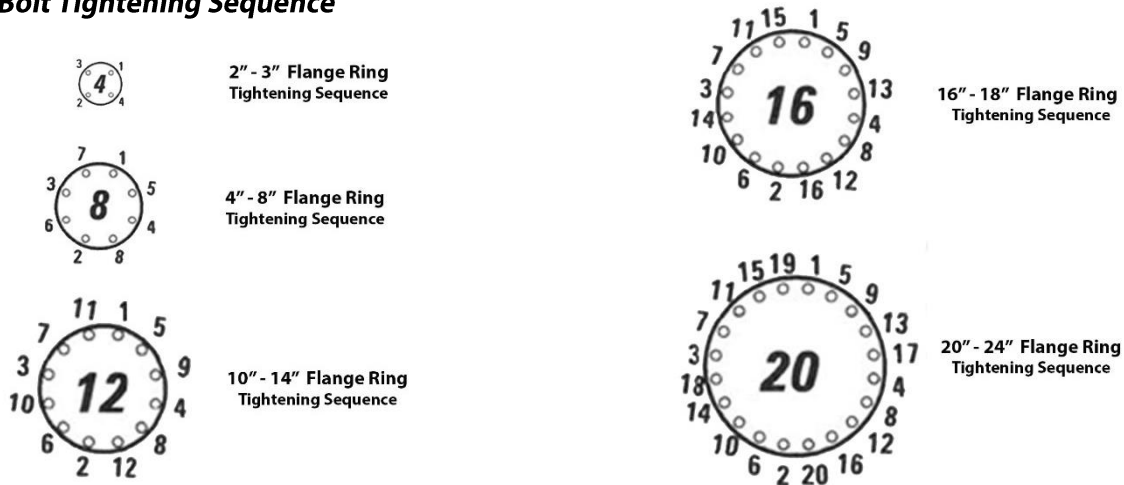
Bolts should be lubricated. Dry bolts require higher torque to provide the same clamping force as lubricated bolts. Lubricate with a non-fluid lubricant grease.

**Table 1 - Bolt Torque Values Using Lubricated Bolts**

Bolt Size		With Rubber Gasket **	PE to PE With No Gasket	Maximum Torque
In.	TPI	Ft.-lbs.	Ft.-lbs.	Ft.-lbs.
5/8	11	40	60	100
3/4	10	65	100	125
7/8	9	120	150	150
1	8	150	150	200
1-1/8	8	160	160	250
1 1/4	8	220	220	300

\*\* Verify with the gasket supplier that the torque meets minimum clamping force for the gasket.

**Figure 1 – Bolt Tightening Sequence**



### Special Flange Installation Considerations

- Surface and above grade flanges must be properly supported to avoid bending stresses.
- Below grade flange connections to heavy appurtenances such as valves or hydrants or to metal pipes require a support foundation of compacted, stable granular soil (crushed stone), compacted cement stabilized granular backfill, or reinforced concrete.
- Flange connections next to pipes passing through structural walls must be structurally supported to avoid shear and bending loads.
- When flanging to brittle materials such as cast iron, correct alignment and careful tightening are necessary. Polyethylene flange adapters and stub ends are not full-face, so tightening places a bending stress across the flange face. Over-tightening, misalignment, or uneven tightening can break brittle material flanges.

### Butterfly Valves

When joining a polyethylene flange adapter to a flanged butterfly valve, **the inside diameter of the pipe flange should be checked for valve disk rotation clearance.** The open valve disk may extend into the pipe flange. Valve operation may be restricted if the pipe flange interferes with the disk. If disk rotation clearance is a problem, a Beveled Flange Adapter having sufficient clearance to allow the complete opening of standard valves may be obtained from Integrity Fusion Products.

Butterfly valves must be centered in the flange for proper operation. Installing a butterfly valve with the disk rotated open may aid with alignment. After fitting up and tightening flange bolts to the 5 ft.-lbs. torque value, check the valve to ensure that the valve disk can rotate without interference. Realign, if necessary, then tighten up.

# INTEGRITY Fusion Products, Inc.

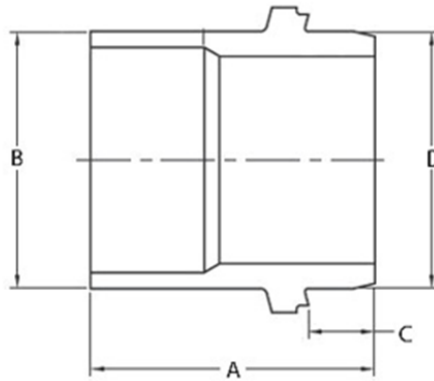
## Injection Molded MJ Adapters & MJ Accessory Kits

**Integrity Fusion Products** offers a full line of injection molded **IPS** and **DIPS** HDPE MJ Adapters with or without an internal stiffener, and **NSF 61/ANSI/AWWA C-153** compliant **Ductile Iron MJ Accessory Kits** for 2" – 12" systems, and **NSF 61/ANSI/AWWA C-110** compliant **Ductile Iron MJ Accessory Kits** for 14" – 24" systems. Integrity Fusion Products injection molded MJ Adapters are manufactured in a variety of nominal pipe sizes and SDR's, in our manufacturing facility located in Peachtree City, GA. **Integrity Fusion Products** injection molded MJ Adapters are manufactured and tested to meet the requirements of ASTM D2513, ASTM D3261, and ANSI/AWWA C901 and C906 for use with outside diameter-controlled pipe and fittings conforming to ASTM D2513, ASTM D3035, and ASTM F-714. Integrity Fusion Product **Molded MJ Adapters** can be heat fused or electrofused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to ASTM D3350.



*NOTE: Gland Kits are imported  
and do not meet BABAA requirements*





<b>Product Family:</b>	Injection Molded Butt Fusion Fitting	<b>Fitting Design:</b>	MJ Adapter
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	3" – 20"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11, 9
		<b>Stiffener Material:</b>	304 Stainless Steel

Manufactured and tested to meet requirements of:

ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61

For use on pipe and fittings conforming to:

ASTM D2513, ASTM D3035, ASTM F-714

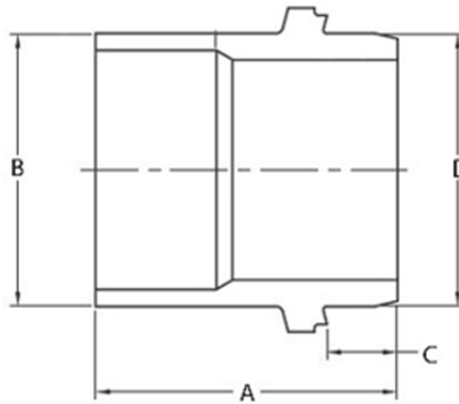
*For Material and Testing information, please refer to our Molded Fitting Specification Sheet.*

### IPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	Note	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
3" IPS		9.00	3.500	2.34	3.960	1.45	100504	FM 200
3" IPS	w/stiffener	9.00	3.500	2.34	3.960	1.85	100506	FM 200
4" IPS		10.25	4.500	2.34	4.800	2.55	100512	FM 200
4" IPS	w/stiffener	10.25	4.500	2.34	4.800	3.00	100514	FM 200
6" IPS		11.31	6.625	2.34	6.900	5.50	100520	FM 200
6" IPS	w/stiffener	11.31	6.625	2.34	6.900	6.15	100522	FM 200
8" IPS		11.94	8.625	2.34	9.050	9.60	100528	FM 200
8" IPS	w/stiffener	11.94	8.625	2.34	9.050	10.50	100530	FM 200
10" IPS		13.56	10.75	2.34	11.10	15.90	100536	FM 200
10" IPS	w/stiffener	13.56	10.75	2.34	11.10	17.10	100538	FM 200
12" IPS		13.00	12.75	2.34	13.20	23.90	100544	FM 200
12" IPS	w/stiffener	13.00	12.75	2.34	13.20	24.20	100546	FM 200
14" IPS		13.00	14.00	1.75	15.30	29.00	100550	-----
14" IPS	w/stiffener	13.00	14.00	1.75	15.30	32.00	100551	-----
16" IPS		13.00	16.00	1.75	17.40	41.00	100554	-----
16" IPS	w/stiffener	13.00	16.00	1.75	17.40	43.00	100555	-----
18" IPS		13.00	18.00	1.75	19.50	54.00	100558	-----
18" IPS	w/stiffener	13.00	18.00	1.75	19.50	57.00	100559	-----
20" IPS		15.22	20.00	2.54	21.60	71.00	100562	-----
20" IPS	w/stiffener	15.22	20.00	2.54	21.60	73.00	100563	-----

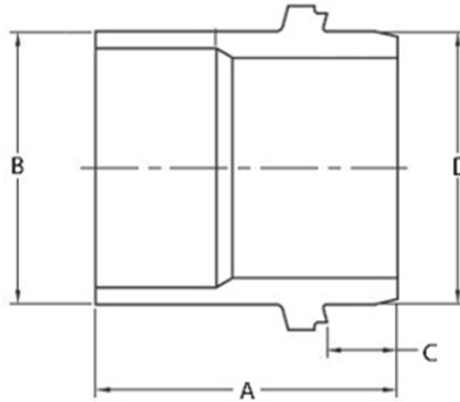


### IPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	Note	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
3" IPS		9.00	3.500	2.34	3.960	1.65	100505	FM 250
3" IPS	w/stiffener	9.00	3.500	2.34	3.960	2.05	100507	FM 250
4" IPS		10.25	4.500	2.34	4.800	2.95	100513	FM 250
4" IPS	w/stiffener	10.25	4.500	2.34	4.800	3.35	100515	FM 250
6" IPS		11.31	6.625	2.34	6.900	6.20	100521	FM 250
6" IPS	w/stiffener	11.31	6.625	2.34	6.900	6.80	100523	FM 250
8" IPS		11.94	8.625	2.34	9.050	11.15	100529	FM 250
8" IPS	w/stiffener	11.94	8.625	2.34	9.050	12.70	100531	FM 250
10" IPS		13.56	10.75	2.34	11.10	18.50	100537	FM 250
10" IPS	w/stiffener	13.56	10.75	2.34	11.10	19.60	100539	FM 250
12" IPS		13.00	12.75	2.34	13.20	28.55	100545	FM 250
12" IPS	w/stiffener	13.00	12.75	2.34	13.20	37.50	100547	FM 250



### DIPS

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

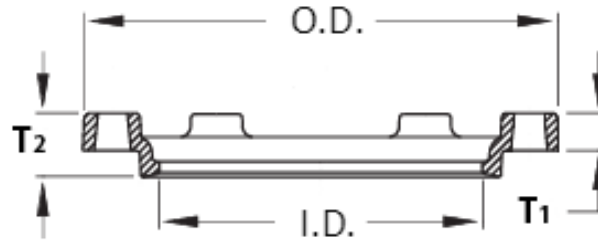
Nominal Size	Note	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
4" DIPS		10.25	4.800	2.34	4.800	2.65	100508	FM 200
4" DIPS	w/stiffener	10.25	4.800	2.34	4.800	3.10	100510	FM 200
6" DIPS		11.31	6.900	2.34	6.900	5.70	100516	FM 200
6" DIPS	w/stiffener	11.31	6.900	2.34	6.900	6.33	100518	FM 200
8" DIPS		11.94	9.050	2.34	9.050	9.95	100524	FM 200
8" DIPS	w/stiffener	11.94	9.050	2.34	9.050	10.90	100526	FM 200
10" DIPS		13.56	11.10	2.34	11.10	16.30	100532	FM 200
10" DIPS	w/stiffener	13.56	11.10	2.34	11.10	17.35	100534	FM 200
12" DIPS		13.00	13.20	2.34	13.20	22.90	100540	FM 200
12" DIPS	w/stiffener	13.00	13.20	2.34	13.20	23.75	100542	FM 200
14" DIPS		14.00	15.30	2.22	15.30	34.00	100548	-----
14" DIPS	w/stiffener	14.00	15.30	2.22	15.30	36.00	100549	-----
16" DIPS		14.00	17.40	2.22	17.40	45.00	100552	-----
16" DIPS	w/stiffener	14.00	17.40	2.22	17.40	47.00	100553	-----
18" DIPS		15.22	19.50	2.63	19.50	59.00	100556	-----
18" DIPS	w/stiffener	15.22	19.50	2.63	19.50	62.00	100557	-----
20" DIPS		15.22	21.60	2.63	21.60	75.00	100560	-----
20" DIPS	w/stiffener	15.22	21.60	2.63	21.60	77.00	100561	-----

### DIPS

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	Note	A [in.]	B [in.]	C [in.]	D [in.]	Weight [lbs.]	Item Code	FM Class
4" DIPS		10.25	4.800	2.34	4.800	3.00	100509	FM 250
4" DIPS	w/stiffener	10.25	4.800	2.34	4.800	3.45	100511	FM 250
6" DIPS		11.31	6.900	2.34	6.900	6.45	100517	FM 250
6" DIPS	w/stiffener	11.31	6.900	2.34	6.900	7.05	100519	FM 250
8" DIPS		11.94	9.050	2.34	9.050	11.75	100525	FM 250
8" DIPS	w/stiffener	11.94	9.050	2.34	9.050	12.55	100527	FM 250
10" DIPS		13.56	11.10	2.34	11.10	18.75	100533	FM 250
10" DIPS	w/stiffener	13.56	11.10	2.34	11.10	19.75	100535	FM 250
12" DIPS		13.00	13.20	2.34	13.20	27.20	100541	FM 250
12" DIPS	w/stiffener	13.00	13.20	2.34	13.20	28.60	100543	FM 250



At Integrity Fusion Products, our goal is to provide the highest quality products to the industry, and to our customers. This philosophy has been applied to the Ductile Iron **MJ Accessory Kits** that are used extensively to make safe and secure connections to ductile-iron and gray-iron fittings, using our **Molded MJ Adapters**. The use of mechanical joint fittings works as a smooth transition point from fusible polyethylene systems and components to valves, hydrants, and other appurtenances for potable water, raw water, nonaggressive wastewater, and reclaimed water supply services. This is done using **HDPE MJ Adapters** and **NSF 61/ANSI/AWWA C-153** compliant Ductile Iron **MJ Accessory Kits** for 2" – 12" systems, and **NSF 61/ANSI/AWWA C-110** compliant Ductile Iron **MJ Accessory Kits** for 14" – 24" systems. The mechanical joint connection differs from compression fitting connections, where compressive forces are applied around the outer circumference of a pipe and/or fitting; and instead, a mechanical joint gland (follower) is used, which is made of ductile iron, to press an **AWWA C111/A.2.11-17** compliant gasket into a mechanical joint bell. Then bolts or studs are threaded through the gland (follower), mechanically squeezing the gasket into place.

### MJ Adapter Kits include:

- Ductile Iron Ring per ASTM A536
- Fusion Bonded Epoxy Coating per ANSI/AWWA C116/A21.16
- High-Strength – Low Alloy Anti-Rotation T-Bolts per ASTM A242
- SBR (styrene-butadiene rubber) Gasket per AWWA C111/A2.11-7
- Manufactured according to NSF 61/ANSI/AWWA C-153 (2" – 12"), and C-110 (14" – 24")

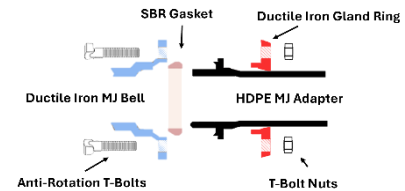
Nominal Size	Type	OD (in.)	ID (in.)	T <sub>1</sub> (thickness)	T <sub>2</sub> (thickness)	Bolt Size	Bolt Qty.	Weight [lbs.]	Item Code
2"	C153	6.120	2.610	0.62	1.37	5/8 x 5	2	2.80	100580
3"	C153	7.690	4.060	0.62	1.37	5/8 x 5	4	6.30	100581
4"	C153	9.120	4.900	0.75	1.50	3/4 x 4.5	4	8.80	100582
6"	C153	11.12	7.000	0.88	1.63	3/4 x 5	6	13.8	100583
8"	C153	13.37	9.150	1.00	1.75	3/4 x 6	6	15.4	100584
10"	C153	15.62	11.20	1.00	1.75	3/4 x 6	8	21.6	100585
12"	C153	17.88	13.30	1.00	1.75	3/4 x 6	8	24.1	100586
14"	C110	20.25	15.44	1.25	2.00	3/4 x 7	10	38.7	100587
16"	C110	22.50	17.54	1.31	2.06	3/4 x 7	12	46.0	100588
18"	C110	24.83	19.64	1.38	2.13	3/4 x 7	12	55.0	100589
20"	C110	27.08	21.74	1.44	2.19	3/4 x 7	14	70.0	100590
24"	C110	31.58	25.94	1.56	2.31	3/4 x 10	16	92.0	100591



The MJ Adapter is a polyethylene fitting that is designed to make a transition to or from a non-polyethylene system by use of a standard ANSI/AWWA mechanical joint and give you the ability to connect a polyethylene system to traditional hydrants, valves, and metal pipes using a standard ANSI/AWWA mechanical joint fitting.

This type of connection requires you to have the following items on-hand to allow you to bolt the mechanical joint together.

- MJ Adapter w/wo Internal Stiffener
- Ductile Iron MJ gland ring,
- AWWA C111/A2.11-7 SBR Gasket, and
- the required number of anti-rotation T-bolts



When putting the MJ Adapter assembly together, it is important to remember to properly place the ductile-iron gland ring on the HDPE pipe side of the MJ Adapter before butt fusing or electro-fusing it on to the pipe. After the fusion joint is made, place the gasket on the mechanical joint side of the adapter with the gaskets bevel pointing outward.

Insert the MJ Adapter, and the gasket (bevel end first), into the socket of the mechanical joint fitting and align the gland ring. Insert the t-bolts and hand tighten the nuts.

Tighten the bolts to the normal range of torque using a torque wrench (see table below) while maintaining approximately the same distance around all points of the MJ Adapters hub and the mechanical joint socket. This can be done by partially tightening the bottom bolt first, then the top bolt, and then the bolts on either side. Repeat the process until all bolts are within the appropriate range of torque.

Pipe Size		Bolt Size		Torque Range	
In.	mm	In.	mm	ft - lb.	N - m
3"	76	5/8	16	45 - 60	61 - 81
4" - 24"	102 - 610	3/4	19	75 - 90	102 - 122
30" - 36"	762 - 914	1	25	100 - 120	136 - 163
42" - 64"	1,067 - 1,600	1 1/4	32	120 - 150	163 - 203

\*\* When the gland ring is used, restraining devices are not required on the PE pipe. (Plastic Pipe Institute – Handbook of Polyethylene Pipe; Chapter 9 PE Pipe Joining Procedures)

# INTEGRITY Fusion Products, Inc.

## Injection Molded Electrofusion Fittings

**Integrity Fusion Products** offers a full line of IntegriFuse **injection molded**, small diameter (**1" – 12"**), and large diameter (**14" – 63"**) **IPS** and **DIPS** Electrofusion Couplers that are manufactured in a variety of nominal pipe sizes and SDR's. All **IntegriFuse Injection Molded Electrofusion fittings** are manufactured and tested to the requirements of **ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901** and **C906**, and are **FM tested and approved** for use with *outside diameter-controlled pipe and fittings conforming to ASTM D2513, ASTM D3035, and ASTM F-714*. **IntegriFuse Injected Molded Electrofusion Fittings** can be fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to ASTM D3350. **IntegriFuse Injection Molded Electrofusion Couplers** are designed with **wider fusion zones** that facilitate increased surface melt and larger melt pools, **wider cold zones** for increased flexibility in pipe stab depths, melt flow indicators for visual confirmation of material expansion in the fusion zone, and have no need for pre-heating procedures when fusing in colder temperatures.





## Molded PE3408 / PE4710 / PE100 Electrofusion Fittings

Integrity Fusion Products **IntegriFuse Electrofusion Fittings**, are all-purpose, injection molded **High-Density Polyethylene Fittings** that are designed and manufactured for use in applications that include, but are not limited to:

- Oil and gas production
- Municipal potable water distribution and service lines
- Stormwater conveyance
- Irrigation
- Mining
- Cable
- Natural gas distribution
- Wastewater conveyance
- Drainage
- Industrial piping applications
- Landfill
- Telecom Conduit



Integrity Fusion Products manufactures **IntegriFuse Electrofusion Fittings** in a variety of sizes and configurations that are produced from virgin, pre-blended, NSF listed bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**.

**IntegriFuse Electrofusion Fittings** from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

- ASTM D2513 - Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- ASTM D3350 - Specification for Polyethylene Plastic Pipes and Fittings Materials
- ASTM D3261 - Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
- ASTM F714 - Specifications for HDPE Pipe Dimensions
- ASTM F1055 - Standard Specification for Electrofusion Fittings
- AWWA C901 - Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service
- AWWA C906 - Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works
- FM 1613 - Approval Standard: Plastic Pipe and Fittings for Underground Fire Protection Service
- ANSI/NSF 61 - Plastic Piping System Components & Related Materials
- ASTM F2880 - Specification for lap-Joint Type Flange Adapters for use on Polyethylene Pressure Pipe

**Integrity Fusion Products IntegriFuse Electrofusion Fittings** are tested in accordance with the following standard ASTM test methods.

- ASTM D1598 - Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
- ASTM D1599 - Short-Term Hydraulic Pressure Failure of Plastic Pipe, Tubing and Fittings.
- ASTM D2122 - Test method for Determining Dimensions of Thermoplastic Pipe and Fittings.

**IntegriFuse Electrofusion Fittings** from Integrity Fusion Products can be fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from **PE3408 / PE4710 / PE100** resin that complies to **ASTM D3350** and are compatible for cross-fusing to **PE2406/PE2708** pipe or fittings without special fusion instructions.

**IntegriFuse Electrofusion Fittings** from Integrity Fusion Products are designed for use on HDPE pressure pipe applications that conform to **ASTM F714, D2513** and **D3350** and are pressure rated according to industry guidelines for natural gas and water applications. (TABLE 1)

Pressure Rating of IntegriFuse PE4710 Electrofusion Fittings		
Fitting SDR (Standard Dimension Ratio)	MAOP (Design Factor of .63)	MAOP (Gas) (Design Factor of .40)
7/9	333/250	125/125
11/17	200/125	125/80
21	100	64
NOTE: Pressure ratings are based on an operating temperature of up to 73° ambient temperature and will need to be reduced for higher temperatures and certain applications.		

TABLE 1

## Conditions for the Required De-Rating of an Electrofusion Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 electrofusion fittings **must be de-rated for elevated temperatures in all service applications**, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR *Title 49 Part 192* regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

*API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0*

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings **should not exceed 140° F.**

Fitting MAOP by SDR vs. Operating Temperature				
SDR	73.4° F	100° F	120° F	140° F
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded electrofusion fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

**Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.**

MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	73.4° F	100° F	120° F	140° F
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

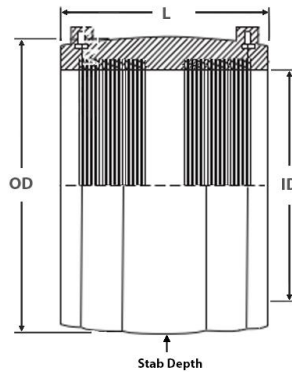
*Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5*

## Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	1.0
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR <i>Title 49 part 192</i> )	1.0
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	.5
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	.5

**IntegriFuse Electrofusion Fittings** from Integrity Fusion Products have a strong resistance to chemical compounds. For more information on the chemical resistance of PE4710 resin, please reference PPI Technical Report TR-19.

**IntegriFuse Electrofusion Fittings** can be stored outdoors but it is highly recommended that **they** be stored indoors in their original packaging. Black HDPE fittings stored properly indoors have an unlimited shelf life.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Coupler
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 36"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	7, 7/9, 11, 11/17
Manufactured and tested to meet requirements of: ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61 For use on pipe and fittings conforming to: ASTM D2513, ASTM D3035, ASTM F-714			

**For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.**

**Call for part #'s for Electrofusion Coupler sizes available with 7/9, and 11/17 SDR's**

## IPS

SDR 11 (standard dimension ratio)

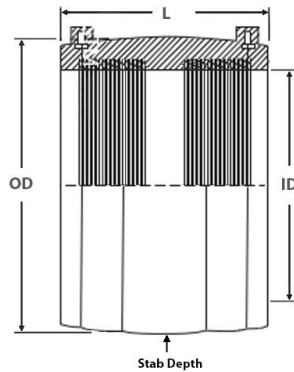
200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
1" IPS	1.70	1.315	3.40	1.315	0.10	200302	----
1 1/4" IPS	2.20	1.660	3.70	1.660	0.20	200303	----
1 1/2" IPS	2.70	1.900	3.90	1.900	0.40	200304	----
2" IPS	3.20	2.375	4.60	2.375	0.50	200305	----
3" IPS	4.40	3.500	5.00	3.500	0.90	200307	FM 200 / FM 232
4" IPS	5.90	4.500	5.90	4.500	1.70	200310	FM 200 / FM 232
5" IPS	6.90	5.563	6.50	5.563	2.50	200312	FM 200 / FM 232
6" IPS	8.70	6.625	7.90	6.625	4.60	200314	FM 200 / FM 232
8" IPS	10.7	8.625	8.90	8.625	8.40	200317	FM 200 / FM 232
10" IPS	13.3	10.75	9.80	10.75	14.9	200320	FM 200 / FM 232
12" IPS	15.9	12.75	11.4	12.75	24.5	200323	FM 200 / FM 232

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

Integrifuse Injection Molded Electrofusion Couplers are designed with **wider fusion zones** that facilitate increased surface melt and larger melt pools, **wider cold zones** for increased flexibility in pipe stab depths, melt flow indicators for visual confirmation of material expansion in the fusion zone, and have no need for pre-heating procedures when fusing in colder temperatures

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**



## IPS

SDR 7 (standard dimension ratio)

335 PSI Water – 125 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	4.750	4.530	2.265	0.60	200306	FM 267 / FM 400
3" IPS	3.500	7.000	5.200	2.600	1.60	200308	FM 267 / FM 400
4" IPS	4.500	9.000	6.300	3.150	3.10	200311	FM 267 / FM 400
6" IPS	6.625	13.25	7.870	3.935	8.20	200315	FM 267 / FM 400
8" IPS	8.625	17.25	9.384	4.692	17.3	200318	FM 267 / FM 400
10" IPS	10.75	21.50	10.83	5.415	31.0	200321	FM 267 / FM 400
12" IPS	12.75	25.50	13.94	6.970	65.0	200324	FM 267 / FM 400

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

## DIPS

SDR 11 (standard dimension ratio)

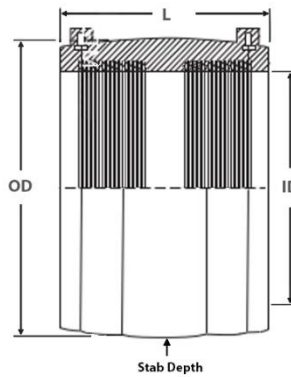
200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
4" DIPS	6.00	4.80	6.10	3.05	2.00	200309	FM 200 / FM 232
6" DIPS	8.50	6.90	7.50	3.75	5.10	200313	FM 200 / FM 232
8" DIPS	11.2	9.05	8.60	4.30	10.0	200316	FM 200 / FM 232
10" DIPS	13.6	11.1	9.80	4.90	14.9	200319	FM 200 / FM 232
12" DIPS	16.3	13.2	11.8	5.90	25.6	200322	FM 200 / FM 232

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Coupler
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	14" – 63"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	7, 9/11, 11, 11/17, 17/26
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61			
<b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

**For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.**

IntegriFuse Injection Molded Electrofusion Couplers are designed with **wider fusion zones** that facilitate increased surface melt and larger melt pools, **wider cold zones** for increased flexibility in pipe stab depths, melt flow indicators for visual confirmation of material expansion in the fusion zone, and have no need for pre-heating procedures when fusing in colder temperatures

**Call for part #'s for Large Diameter Electrofusion Coupler sizes designed for use on variable SDR's; 9/11, 11/17, and 17/26 SDR's – and for Large Diameter Electrofusion Couplers 54" and larger.**

**Note: 54" and 63" couplers available only in SDR 15.5/17 and 21/33 only.**

## IPS

SDR 11 (standard dimension ratio)

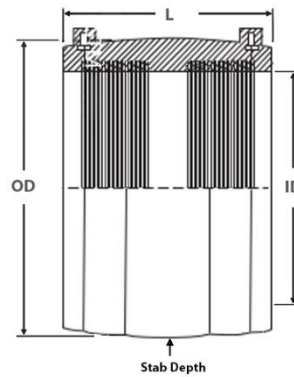
200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
14" IPS	17.20	14.00	11.80	5.900	27.00	200326	FM 200 / FM 232
16" IPS	19.80	16.00	13.90	6.950	32.00	200329	FM 200 / FM 232
18" IPS *	22.30	18.00	16.70	8.350	75.00	200332	FM 200 / FM 232
20" IPS *	24.80	20.00	18.00	9.000	97.00	200335	FM 200 / FM 232
22" IPS *	27.40	22.00	19.50	9.750	123.0	200336	FM 200 / FM 232
24" IPS *	30.60	24.00	19.80	9.900	157.0	200338	FM 200 / FM 232
26" IPS **	31.90	26.00	20.20	10.10	171.0	200339	FM 200 / FM 232
28" IPS **	34.50	28.00	20.70	10.35	203.0	200341	FM 200 / FM 232
30" IPS **	37.00	30.00	20.70	10.35	238.0	200343	----
32" IPS **	39.60	32.00	20.70	10.35	274.0	200345	----
34" IPS **	42.10	34.00	21.70	10.85	308.7	200355	----
36" IPS **	44.10	36.00	21.10	10.85	319.7	200347	----
42" IPS **	51.20	42.00	22.60	11.30	465.2	200349	----
48" IPS **	58.70	48.00	26.20	13.10	661.4	200351	----

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

\* Shows the fitting has dual fusion coils

\*\* Shows the fitting has a dual fusion coil and requires use of the I Fuse I-105 Processor for fusion



## IPS

SDR 7 (standard dimension ratio)

335 PSI Water – 125 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
14" IPS	19.53	14.00	13.78	6.890	70.50	200327	FM 267 / FM 400
16" IPS	22.44	16.00	15.87	7.935	101.0	200330	FM 267 / FM 400
18" IPS *	25.00	18.00	17.91	8.955	140.0	200333	FM 267 / FM 400
20" IPS *	28.00	20.00	18.50	9.250	TBD	200357	FM 267 / FM 400
22" IPS *	30.90	22.00	19.70	9.850	TBD	200358	FM 267 / FM 400
24" IPS *	33.60	24.00	20.70	10.35	TBD	200359	FM 267 / FM 400

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

\* - shows the fitting has dual fusion coils

\*\* Shows the fitting has a dual fusion coil and requires use of the I Fuse I-105 Processor for fusion

## DIPS

SDR 11 (standard dimension ratio)

200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	OD [in.]	ID [in.]	L [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
14" DIPS	18.90	15.30	13.90	6.950	45.00	200325	FM 200 / FM 232
16" DIPS	21.30	17.40	16.60	8.300	60.00	200328	FM 200 / FM 232
18" DIPS *	25.00	19.50	17.90	8.950	107.0	200331	FM 200 / FM 232
20" DIPS *	27.40	21.60	19.50	9.750	133.0	200334	FM 200 / FM 232
24" DIPS *	31.90	25.80	20.30	10.15	177.0	200337	FM 200 / FM 232
30" DIPS **	39.60	32.00	20.70	10.35	274.0	200356	Use 32" IPS Coupler
36" DIPS **	47.40	38.30	22.80	11.40		Special Order	-----
42" DIPS **	54.00	44.50	25.20	12.60		Special Order	-----
48" DIPS **		50.80				Special Order	-----

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

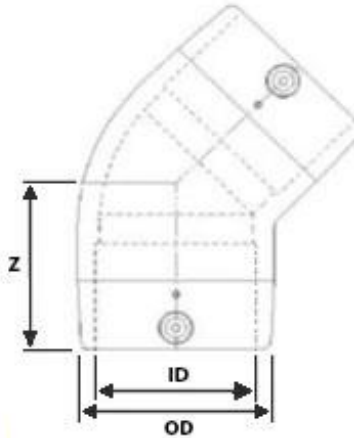
\* Shows the fitting has dual fusion coils

\*\* Shows the fitting has a dual fusion coil and requires use of the I Fuse I-105 Processor for fusion

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. *Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"*

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.

### 45° Elbow



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	45° Elbow
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	2" – 8"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61			
<b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

*For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.*

### IPS

SDR 11 (standard dimension ratio)

200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

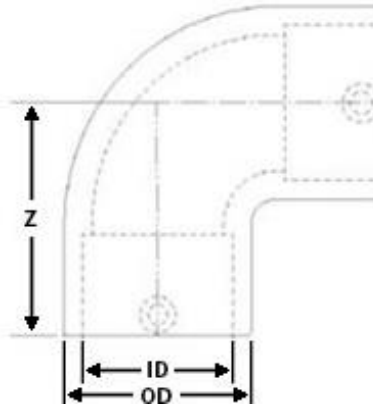
Nominal Size	OD [in.]	ID [in.]	Z [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
2" IPS	2.375	2.7	2.7	-----	0.90	200054	FM 200 / FM 232
3" IPS	3.500	3.7	3.7	-----	2.10	200055	FM 200 / FM 232
4" IPS	3.500	4.7	4.7	-----	5.70	200056	FM 200 / FM 232
6" IPS	4.500	6.3	6.3	-----	8.50	200057	FM 200 / FM 232
8" IPS	8.625	8.0	6.0	-----	18.5	200058	FM 200 / FM 232

**NOTE:** Stab Depths are based on current fitting design and lengths and may be subject to change

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.

### 90° Elbow



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	90° Elbow
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin – no regrind	<b>Nominal Pipe Sizes:</b>	4" – 8"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Available SDR Range:</b>	11
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61			
<b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

**For Material and Testing information, please refer to our Molded Fitting Specification Sheet.**

### IPS

SDR 11 (standard dimension ratio)

200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

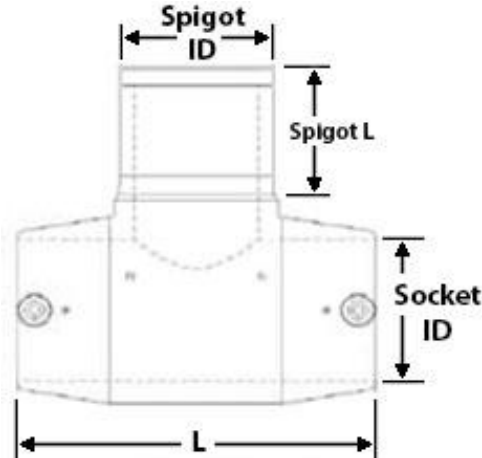
Nominal Size	OD [in.]	ID [in.]	Z [in.]	Stab Depth [in.]	Weight [lbs.]	Item Code	FM Class
4" IPS	4.500	5.90	5.90	----	6.60	200156	FM 200 / FM 232
6" IPS	6.625	8.40	8.40	----	9.20	200157	FM 200 / FM 232
8" IPS	8.625	10.0	10.0	----	21.8	200158	FM 200 / FM 232

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.





<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Equal Tee
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	3/4" – 8"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
		<b>Nominal Spigot Sizes:</b>	3/4" – 8"
<b>Manufactured and tested to meet requirements of:</b>		ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

*For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.*

## IPS

SDR 11 (standard dimension ratio)

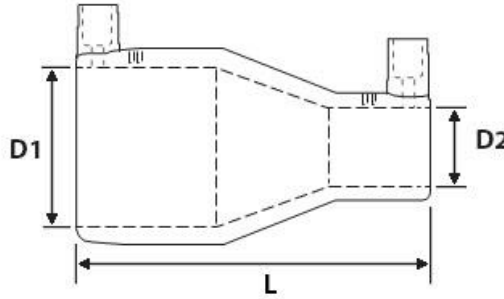
200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	Socket ID [in.]	L [in.]	Spigot OD [in.]	Spigot L [in.]	Weight [lbs.]	Item Code	FM Class
3/4" IPS	1.050	4.30	1.050	1.5	0.30	200600	-----
1 1/4" IPS	1.660	5.50	1.660	1.9	0.40	200603	-----
1 1/2" IPS	1.900	6.40	1.900	1.9	0.70	200604	-----
2" IPS	2.375	6.90	2.375	2.7	1.30	200654	-----
3" IPS	3.500	8.20	3.500	3.2	3.30	200655	-----
4" IPS	4.500	10.4	4.500	3.5	5.90	200656	-----
6" IPS	6.625	13.2	6.625	4.0	17.9	200657	-----
8" IPS	8.625	15.5	8.625	4.4	43.9	200658	-----

NOTE: Stab Depths are based on current fitting design and lengths and may be subject to change

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Reducing Coupler
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Pipe Sizes:</b>	1" – 4"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61 <b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

*For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.*

### IPS

SDR 11 (standard dimension ratio)

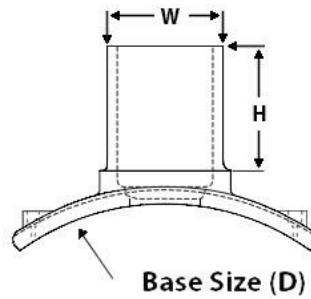
200 PSI Water – 100 PSI Gas (MAOP @ 73.4° F)

Nominal Size	D1 [in.]	L [in.]	D2 [in.]	Weight [lbs.]	Item Code	FM Class
1" IPS x ¾" IPS	1.315	3.50	1.050	0.10	200500	-----
1 ¼" IPS x 1" IPS	1.660	4.60	1.315	0.20	200551	-----
1 ½" IPS x 1" IPS	1.900	5.20	1.315	0.30	200501	-----
2" IPS x ¾" IPS	2.375	5.60	1.050	0.50	200553	-----
2" IPS x 1" IPS	2.375	5.70	1.315	0.50	200554	-----
2" IPS x 1 ¼" IPS	2.375	5.60	1.660	0.50	200555	-----
2" IPS x 1 ½" IPS	2.375	5.00	1.900	0.60	200556	-----
3" IPS x 2" IPS	3.500	6.40	2.375	0.80	200557	-----
4" IPS x 2" IPS	4.500	8.80	2.375	1.60	200558	-----
4" IPS x 3" IPS	4.500	7.70	3.500	1.80	200559	-----

**NOTE:** Stub Depths are based on current fitting design and lengths and may be subject to change

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Branch Saddle
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Base Sizes:</b>	2" – 32"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's</b>	11
		<b>Nominal Outlet Sizes:</b>	2" – 12"
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61			
<b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

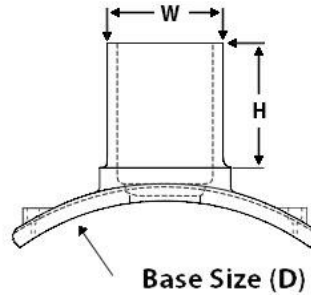
*For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.*

## IPS & DIPS Fixed Base Saddles

SDR 11- Pipe Diameter Specific

200 PSI (MAOP @ 73.4° F)

Outlet Size (W) [in.]	Dedicated Base Size (D) [in.]	H [in.]	Weight [lbs.]	Item Code	Straps Incl.	FM Class
2" IPS	2" IPS	3.50		200285	1	----
	3" IPS	3.50		200279	1	----
	4" IPS	3.50		200276	1	----
	4" DIPS	3.50		200275	1	----
4" IPS	6" IPS	4.30		200277	2	FM 220
	10" IPS	4.30		200220	2	FM 220
6" IPS	10" IPS	4.30		TBD	2	----
	12" IPS	4.30		TBD	2	----
6" DIPS	12" DIPS	7.90		TBD	2	----
8" IPS	12" IPS	7.90		200225	2	FM 220
	16" IPS	7.90		TBD	2	----
	18" IPS	7.90		TBD	2	----
	22" IPS	7.90		200211	2	FM 220
	24" IPS	7.90		200282	2	FM 220
	26" IPS	7.90		200213	2	FM 220
	30" IPS	7.90		TBD	2	----
10" IPS	36" IPS	7.90		TBD	2	----
	16" IPS	7.90		TBD	2	----
	18" IPS	7.90		TBD	2	----
	20" IPS	7.90		TBD	2	----
12" IPS	24" IPS	7.90		TBD	2	----
	32" IPS	7.90		200215	2	FM 220



## IPS & DIPS Multi- Base Saddles

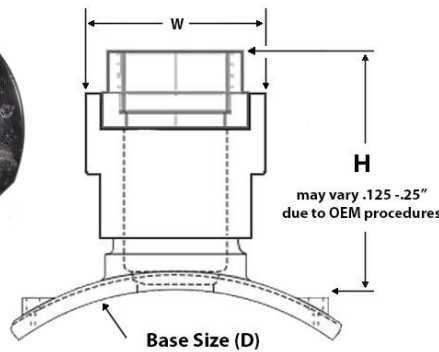
SDR 11- Flexible Saddle Bases Will Fit Multiple Pipe Diameters Pipe Diameter

200 PSI (MAOP @ 73.4° F)

Outlet Size (W) [in.]	Multi-Base Size Range (D) [in.]	H [in.]	Weight [lbs.]	Item Code	Straps Incl.	FM Class
2" IPS	6" IPS – 6" DIPS	3.50		200274	1	----
	8" IPS/DIPS – 10" DIPS	3.50		200200	1	----
	12" IPS/DIPS – 18" IPS	3.50		200203	1	----
	20" IPS/ DIPS – 22" IPS	3.50		200241	1	----
	20" IPS/DIPS – 36" IPS	3.50		200254	2	FM 220
3" IPS	6" IPS – 6" DIPS	3.50		200281	2	FM 220
	8" IPS/DIPS – 10" DIPS	3.50		200217	2	FM 220
	12" IPS/DIPS – 18" IPS	3.50		200223	2	FM 220
	20" IPS/ DIPS – 22" IPS	3.50		200210	2	FM 220
	20" IPS/DIPS – 36" IPS	3.50		200255	2	FM 220
4" IPS	8" IPS – 8" DIPS	4.30		200218	2	FM 220
	12" IPS/DIPS – 16" DIPS	4.30		200206	2	FM 220
	18" IPS/DIPS – 20" DIPS	4.30		200234	2	FM 220
	22" IPS/ DIPS – 26" IPS	4.30		200212	2	FM 220
	28" IPS/ DIPS – 32" IPS	4.30		200272	2	FM 220
	34" IPS – 42" IPS	4.30		200216	2	FM 220
6" IPS	18" IPS/DIPS – 20" DIPS	4.30		200235	2	FM 220
	22" IPS/ DIPS – 26" IPS	4.30		200214	2	FM 220
	28" IPS/ DIPS – 32" IPS	4.30		200273	2	FM 220

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Transition Saddle
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Base Sizes:</b>	2" – 36"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>Outlet Material</b>	ANSI/ NSF-372 No-Lead Brass or 316 Stainless Steel	<b>Threaded Outlet:</b>	Over Molderd/ Factory Fused
<b>Thread Patterns</b>	ANSI/AWWA C800 Standard CC or ANSI B1.20 NPT NSF/ANSI-372	<b>Threaded Outlet Sizes:</b>	3/4" – 2"

Manufactured and tested to meet requirements of: ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61  
 For use on pipe and fittings conforming to: ASTM D2513, ASTM D3035, ASTM F-714

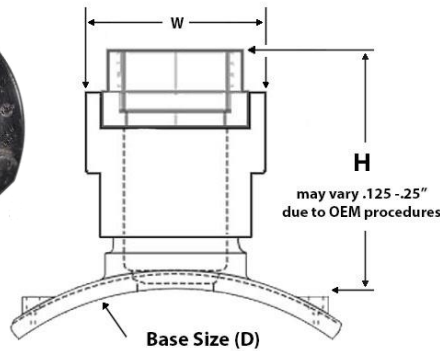
*For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.*

## IPS & DIPS Fixed Base Saddles

SDR 11- Pipe Diameter Specific

200 PSI (MAOP @ 73.4° F)

Base Size (D) [in.]	Outlet t Size	Outlet Type	Thread Pattern	H [in.]	W [in.]	Weight [lbs.]	Item Code	Straps Incl.
2" IPS (fixed base)	3/4"	Brass	CC	3.06	2.53		200850	1
	1"	Brass	CC	3.06	2.53		200851	1
	1"	Brass	NPT	3.06	2.53		200852	1
	2"	Brass	NPT	4.37	3.67		200854	1
	1"	316 Stainless	NPT	4.37	2.53		200853	1
	2"	316 Stainless	NPT	4.37	3.67		200855	1
3" IPS (fixed base)	3/4"	Brass	CC		2.53		200841	1
	1"	Brass	CC		2.53		200805	1
	1"	Brass	NPT		2.53		200803	1
	2"	Brass	NPT		3.67		200801	1
	1"	316 Stainless	NPT		2.53		200804	1
	2"	316 Stainless	NPT		3.67		200802	1
4" IPS (fixed base)	3/4"	Brass	CC		2.53		200842	1
	1"	Brass	CC		2.53		200810	1
	1"	Brass	NPT		2.53		200808	1
	2"	Brass	NPT		3.67		200806	1
	1"	316 Stainless	NPT		2.53		200809	1
	2"	316 Stainless	NPT		3.67		200807	1
4" DIPS (fixed base)	3/4"	Brass	CC		2.53		200843	1
	1"	Brass	CC		2.53		200815	1
	1"	Brass	NPT		2.53		200813	1
	2"	Brass	NPT		3.67		200811	1
	1"	316 Stainless	NPT		2.53		200814	1
	2"	316 Stainless	NPT		3.67		200812	1



## IPS & DIPS Multi-Base Saddles

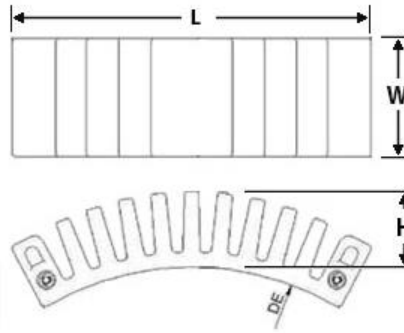
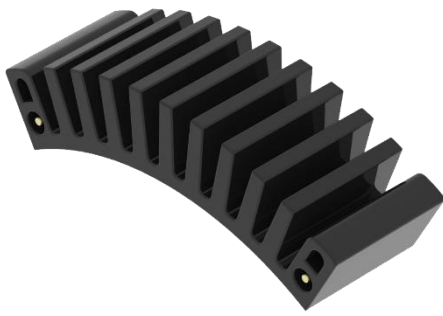
SDR 11 Flexible Saddle Bases Will Fit Multiple Pipe Diameters

200 PSI (MAOP @ 73.4° F)

Base Size (D) [in.]	Outlet Size	Outlet Type	Thread Pattern	H [in.]	W [in.]	Weight [lbs.]	Item Code	# of Straps Incl.
6" IPS / DIPS (multi - base)	3/4"	Brass	CC		2.53		200844	1
	1"	Brass	CC		2.53		200820	1
	1"	Brass	NPT		2.53		200818	1
	2"	Brass	NPT		3.67		200816	1
	1"	316 Stainless	NPT		2.53		200819	1
	2"	316 Stainless	NPT		3.67		200817	1
8" IPS/DIPS – 10" IPS/DIPS (multi - base)	3/4"	Brass	CC		2.53		200845	1
	1"	Brass	CC		2.53		200825	1
	1"	Brass	NPT		2.53		200823	1
	2"	Brass	CC		3.67		200822	1
	1"	316 Stainless	NPT		2.53		200824	1
	2"	316 Stainless	NPT		3.67		200821	1
12" IPS/DIPS – 18" IPS (multi - base)	3/4"	Brass	CC		2.53		200846	1
	1"	Brass	CC		2.53		200830	1
	1"	Brass	NPT		2.53		200828	1
	2"	Brass	NPT		3.67		200826	1
	1"	316 Stainless	NPT		2.53		200829	1
	2"	316 Stainless	NPT		3.67		200827	1
20" IPS/DIPS – 36" IPS (fixed base)	3/4"	Brass	CC		2.53		200848	2
	1"	Brass	CC		2.53		200840	2
	1"	Brass	NPT		2.53		200838	2
	2"	Brass	NPT		3.67		200836	2
	1"	316 Stainless	NPT		2.53		200839	2
	2"	316 Stainless	NPT		3.67		2005837	2

Fusion times for Electrofusion fittings are specifically determined to generate the proper "melt pool" needed to effectively join pipe and fittings based on specific SDR range of the fitting. The standard "rule of thumb" of +/- 1 SDR still applies to electrofusion fittings. SDR 11 Couplers can be fused on SDR 17 or SDR 9 pipe using the same fusion time. For applications with wall thicknesses that exceed +/- 1 SDR, the installer must contact Integrity Fusion Products for barcodes with modified fusion times, if available. **Important Note: "systems installing components containing differing SDR's must be de-rated to the pressure rating of the component possessing the lowest pressure rating"**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.



<b>Product Family:</b>	Injection Molded Electrofusion Fitting	<b>Fitting Design:</b>	Flex Restraint
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Fits Nominal Base Sizes:</b>	6" – 63"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Fits Nominal Pipe Standard:</b>	IPS and DIPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>For Use on SDR Range:</b>	7, 9, 11, 21
<b>Manufactured and tested to meet requirements of:</b> ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901 & C906, FM 1613, NSF 61			
<b>For use on pipe and fittings conforming to:</b> ASTM D2513, ASTM D3035, ASTM F-714			

**For Material and Testing information, please refer to our Electrofusion Fitting Specification Sheet.**

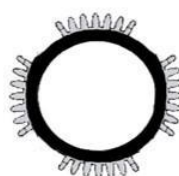
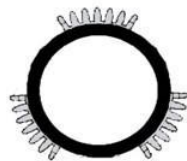
Instead of simply using the outside edges of the Flex Restraint to serve as the fittings cold zone; the design of the **IntegriFuse Electrofusion Flex Restraint** incorporates an innovative fusion coil pattern that includes built in cold zones that results in more consistent melt pools and interfacial pressures being generated in the fusion zone. This unique fusion coil design results in higher axial resistance performance than others in the marketplace.

## A Surface Mounted Fitting that Fits on IPS & DIPS Pipe

Nominal Size	L [in.]	W [in.]	H [in.]	Weight [lbs.]	Item Code	Axial Load Restraint Capacity (based on a safety factor of 2)
6" IPS/DIPS – 63" IPS/DIPS	7.50	2.45	1.56	0.42	200400	9,500 LBS

### Important Note:

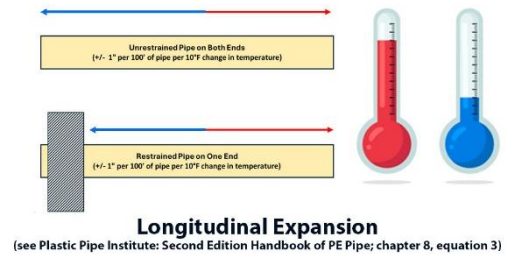
- A design engineer must calculate the amount of thrust force that will result from expansion & contraction to decide the proper quantity of Flex Restraints needed for each application.
- Flex Restraints must be placed equally spaced and equally sectored on the surface of the pipe.
- Flex Restraints must be equally aligned around the circumference of the pipe.



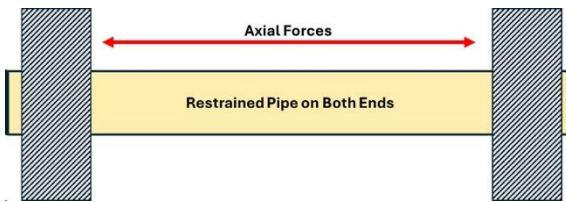
**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.

High-density polyethylene (HDPE) pipe and fittings are well-known to be thermally stable and possess excellent mechanical properties and chemical resistance; that is why as a construction material, HDPE has become increasingly popular in a growing number of applications. However, there is one HDPE material characteristic that often causes confusion and frustration, particularly when used in above ground and submersible applications.

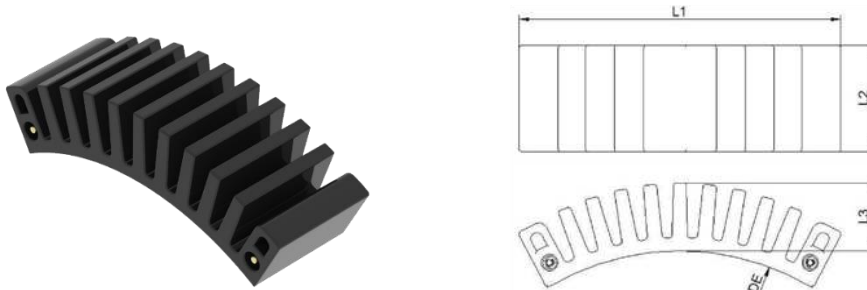
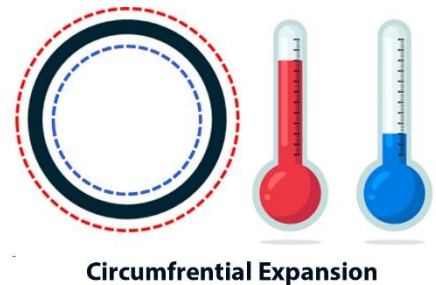
Eventhough HDPE is thermally stable, it is also known to have a high **thermal coefficient of expansion/contraction**, which basically means in simple terms, that an HDPE system will will expand or contract when it experineces changes in temperature. Sure, all pipes expand and contract when they experience fluctuations in temperature, but for HDPE, sudden changes in temperature in **unrestrained**, above and below grade applications will result (as a rule of thumb), in an expansion or contraction of an HDPE pipe **+/- 1" per 100' of pipe per 10°F change in temperature**.



This can result in a significant movement of pipe in unrestrained systems, and conversely, significant amounts of axial force can be generated in semi-restrained pipe systems that can result in unwanted complications and failures; both scenarios must somehow be controlled and managed. So being aware of HDPE's thermal expansion coefficient, and knowing that it can be managed and controlled by the use of Electrofusion Flex Restraints is crucial, and systems should always be designed to account for this potential if fluctuating temperatures are anticipated. The key however, is in how this thermal strain is managed when designing an HDPE piping systems to maximize its overall performance and longevity.



However, what must also be kept in mind, is that the effects of **thermal expansion/contraction** do not just affect HDPE pipe **longitudinally**. They also affect an HDPE pipe **circumfrentially** as well; so both aspects of this expansion and contraction must be taken into consideration when designing a HDPE piping system – particulaly in above ground and submersible applications. In most below ground systems, HDPE pipe does not move after it has been buried, allowed to relax, and acclimated to its surrounding ambient ground temperature. The HDPE system then becomes much more stable than an above ground pipeline due to the soil friction and earth load on the pipe surface and attached appurtenances.



## A Surface Mounted Fitting that Fits on IPS & DIPS Pipe

Nominal Size	L [in.]	W [in.]	H [in.]	Weight [lbs.]	Item Code	Axial Load Restraint Capacity (based on a safety factor of 2)
6" IPS/DIPS – 63" IPS/DIPS	7.50	2.45	1.56	0.42	200400	9,500 LBS

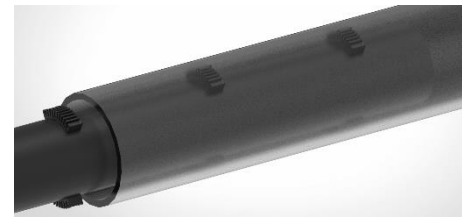
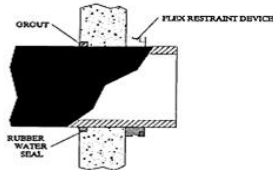
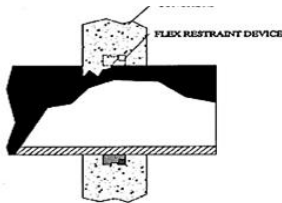


**For Material and Testing information, please refer to our Molded Electrofusion Fitting Specification Sheet.**

The **IntegriFuse EF Flex Restraints** are designed to be fused directly onto the OD of HDPE pipe. This a unique electrofusion fitting is specifically designed to be a simple, permanent, and robust electrofusion restraint alternative from traditional thrust collars, water stops, and wall anchors.

**IntegriFuse EF Flex Restraints** are used in an increasing variety of applications including, but not limited to:

- Wall anchors
- Thrust anchors
- Restricting the movement of submersible concrete anchors
- Temporary under bridge by-pass lines,
- Securing mechsanical connections when connecting HDPE pipe to non-HDPE bell and gasket fittings
- Manhole rehabilitation restraints
- Restricting pull-back forces after slip-lining HDPE
- Anchor points for vertical HDPE applications
- Securing a pipe repair using a mechanical coupling.



The **IntegriFuse Electrofusion Flex Restraint** design incorporates an innovative “next generation” fusion coil pattern that creates a robust fusion joint on the surface OD of HDPE pipes for the purpose of resisting and controlling axial forces created by temperature induced expansion and contraction.

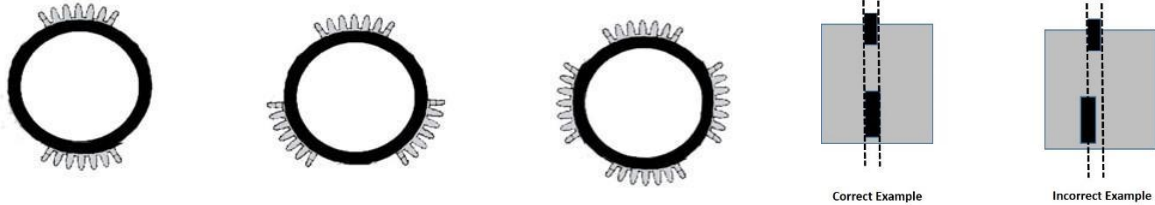
Instead of using the outside edges of the Flex Restraint to serve as the flex restraint cold zone; this second generation design of the IntegriFuse Electrofusion Flex Restraint incorporates an innovative fusion coil pattern that includes built in cold zones that increases our second generation flex restraint performance to 9,500 ft. lbs of axial resistance. A significant increase over the first generations 7,500 ft. lb. design.



**Important Note:**

- **A design engineer must calculate the amount of thrust force that will result from expansion & contraction to decide the proper quantity of Flex Restraints needed for each application.**
- **Flex Restraints must be equally spaced and equally sectored on the surface of the pipe.**
- **Flex Restraints require a straight-line orientation around the circumference of the pipe.**

*(A minimum of 2 Flex Restraints must always be used to equally distribute the forces being resisted. The maximum # of restraints shown in this chart is how many Flex Restraints can be placed on the pipe surface, end-to-end, around its circumference. If the expected axial forces require more Flex Restraints to be used than can be placed in a single line, place another line of equidistantly spaced Flex Restraints with approx. 9 in. between lines.)*



The data provided in the following table is for use only as a guideline for the designer. The maximum number of restraints per pipe OD in this chart only reflects the total number of Flex Restraints that can be placed in a straight line around the circumference of a specified pipe OD. The designer must calculate and figure out all expansion/contraction forces in their specific application and for calculating the right number of flex restraints to be used for restraining those forces. The designer should consider all other affecting factors.

Pipe OD	Max. # of Restraints**	Pipe OD	Max. # of Restraints**	Pipe OD	Max. # of Restraints**	Pipe OD	Max. # of Restraints**
6"	3	18"	9	30"	15	42"	21
8"	4	20"	10	32"	16	48"	-----
10"	5	22"	11	34"	17	54"	-----
12"	6	24"	12	36"	18	63"	-----
14"	7	26"	13	38"	19		
16"	8	28"	14	40"	20		

**\*\*Refers to the maximum number of restraints per pipe OD in this chart only reflects the total number of Flex Restraints that can be placed in a straight line around the circumference of a specified pipe OD.**

**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.

## Installation Procedure:

**Step 1** - Find the desired location for the Flex Restraints. Keep Flex Restraints in their original packaging until ready to place and secure.

**Step 2** - Remove all sources of contamination from the surface of the pipe using clean water & dry with clean cloth.

**Step 3** – Using an approved marking pen, clearly mark the location where each flex restraint is to be installed. Also highlight the complete fusion area with the pen, as this will provide a visual guide while scraping.

**Step 4** – Scrape the area where the Flex Restraint is to be placed making sure to remove the thin layer of oxidation from the pipe surface (**.007" minimum**) using an approved scraper/peeler tool. Scrape/peel the marked area until the required amount of material is removed, and all the pen marks are no longer visible. **(Rasps, grinders & wire brushes/wheels are NOT allowed)**

**Step 5** – Clean the scraped area using a 90% or greater solution of Isopropyl Alcohol and a clean lint free rag making sure that the surface area of the pipe where the Flex Restraints are to be applied are free of contaminants. Remove the Flex Restraint from its packaging and clean the fitting base of the Flex Restraint to remove any accidental contamination of these areas. **(NO other cleaning agent is allowed). Do not touch pipe surface or fitting base after cleaning.**

**Step 6** – Place the Flex Restraint at once on the prepared surface where it is to be fused and secure it in place with a 2" ratchet strap. 2" Ratchet straps are the required application tool due to the ease of use and more reliable distribution of clamping pressures.

**Step 7** – While holding the Flex Restraint in place, tighten the 2" ratchet strap until the Flex Restraints are conformed to the pipe wall. When installing just one Flex Restraint, make sure the ratchet buckle is 180 degrees/opposite the flex restraint before tightening. It is critical to ensure that the base of the Flex Restraint contacts the pipe over the entire fusion area, and no gap can be seen between fitting and the pipe. If more than one Flex Restraint is to be fused, make sure that all fittings are in place before completely securing the ratchet straps, ensuring the ratchet buckle is equidistant between two of the Flex Restraints before tightening.

**Step 8** – Start generator, connect the processor leads to the Flex Restraint and enter the fusion data by scanning the bar-code or entering the fusion data in manual mode. Due to the location and/or the number of flex restraints being used; It may be necessary to scan a separate fitting to input the fusion data.

**Step 9** – After the fusion cycle has completed, leave the Flex Restraint strapped in place until ALL the fittings have cooled.

**\*\*\* Note: This abbreviated version of our Electrofusion Instructions is for reference and a reminder. For more complete details concerning job site and installation requirements please refer to our Electrofusion Training and Installation Manual.**





Properly prepared, assembled, and fused Flex Restraints were installed on a pipe sample and tested by applying 3,700 psi to the Flex Restraint joints (the equivalent of 19,700 ft. lbs.) and held for 30 minutes. The test assembly passed and was cut in half to visually inspect the fusion zone for signs of stress and possible failure. None was found.



Properly prepared, assembled, and fused Flex Restraints were installed on a pipe sample and tensile tested to failure. The pipe wall began ripping out at just under 24,000 lbs. ft. lbs...

### Available PPI Flex Restraint Calculators

<https://www.plasticpipecalculator.com/ThermalExpansion.aspx>

<https://hdpeapp.com/#/installation/below/anch>

## Limited Product Warranty

Integrity Fusion Products, Inc. warrants its materials to be free of defects in workmanship under normal use and service, when used for purposes under the conditions for which they are intended for a period of one (1) year.

*This warranty shall not apply to any Integrity Fusion Products, Inc. material that has been altered, repaired and/or used in any way, stored outside, or has been subject to misuse, negligence, accident and/or has not been installed in accordance with installation instructions.*

*This warranty does not cover labor or other costs of installing or repairing the products. Buyer's sole remedy for defective product shall be to receive replacement product as provided in this Limited Warranty. Seller's liability arising out of or related to the product supplied by Integrity Fusion Products shall in no event exceed the original price of the defective product. Seller will not be liable for any consequential, incidental, special, indirect or punitive damages, loss of profits, loss of business opportunity or other loss even if seller knew or should have known of the possibility of such damages or losses. Buyer shall assume all responsibility and expenses for removal, reinstallation and freight charges in connection with the foregoing remedy.*

*Integrity Fusion Products, Inc. shall not be held liable for any delays caused by shipping any material or equipment by third party shipping companies. Integrity Fusion Products, Inc. shall not be responsible for any delays caused by shipping errors of material and/or equipment.*

*Any claim regarding shortage or damages from shipment of material must be submitted in writing to Integrity Fusion Products, Inc within 7 days after receipt of shipment. Buyer shall note loss or damage on shipment Bill of Lading and provide a delivery receipt stating such with driver's signature. Loss or damages to materials in transit is the responsibility of the carrier*

*The buyer must comply with the standard warranty investigation procedures for Integrity Fusion Products which includes providing sample of the product in question and completing Integrity Fusion Products Investigation Report Form. Failure to provide needed and required information and samples for investigation purposes will result in the limited warranty being null and void.*

### General Electrofusion Requirements

*Installation of electrofusion fittings requiring 42V-48V must be carried out using an IntegriFuse or I Fuse 105 Electrofusion processor. For IntegriFuse Electrofusion fittings requiring an amperage of over 80 amps, the IntegriFuse I Fuse 105 Electrofusion Processor is required.*

*The I Fuse 105 Electrofusion processor is an 8-48-volt output multi-voltage fusion processor with temperature compensating feature operating at 220/230 VAC requiring power supplied through a portable power generator rated at the necessary continuous watts.*

*If pipe is out of round the use of a Re-Round Clamp is required to ensure proper installation.*

*Improper scraping, cleaning, and alignment of pipe during the installation procedures results in limited warranty being null and void.*

*Electrofusion Installation instructions must be adhered to or our Limited Warranty is null and void. Installation of electrofusion fittings must be carried out by properly trained and qualified operator(s). Large diameter fittings require certification by Integrity Fusion Products, Inc.*

### Integrifuse Valve

*The Limited Warranty shall apply only to operations which falls under the guidelines of conditions in which the valve was designed for and for applications of normal use. The limited liability will be null and void in the case that the valve failure was caused by excessive operating or surge pressure, introduction of any chemicals or acids that cause degradation to the seats or stem, excessive water hammer, introduction of abrasives such as sand and or grit, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted), hot soil conditions, excessive temperature.*

### Integrifuse Butt Fusion Fittings

*The Limited Warranty shall apply only to operations which fall under the guidelines of conditions in which the butt fusion fitting was designed for and for applications of normal use. The limited liability will be null and void in the case that the fitting failure was caused by excessive operating or surge pressure, excessive water hammer, introduction of abrasives such as sand and or grit that have cause abrasion of the fitting, butt fusion of HDPE pipe material with SDR differences greater than 2 (SDR 11 to SDR 17 is not permitted). This warranty does not cover failure resulting from improper fusion by the installer.*

**Purchaser is responsible for passing on this Limited Warranty to their customer.**

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## Re: Warranty Questions Concerning IntegriFuse Electrofusion Products Installed by Certified Field Technicians Trained by Other Companies

There are three questions that must be addressed concerning the IntegriFuse Electrofusion Product Warranty. The first question regards the **product warranty itself**, the second question regards the **proper installation requirements** of IntegriFuse Electrofusion Products by **individuals not trained by Integrity Fusion Products** and how that may affect our warranty, the third question regards electrofusion **equipment compatibility**, and the fourth question regards the SDR range of the pipe the fitting is being fused on to.

### (1) Product Warranty

The IntegriFuse Electrofusion Product Warranty covers the material and workmanship of the product only.

*“Warrants its materials to be free of defects in workmanship under normal use and service, when used for the purposes under the conditions for which they are intended for a period of one (1) year excluding the golf and irrigation markets. This warranty shall not apply to any Integrity Fusion Products, Inc. material that has been altered, repaired and/or improperly used in any way, stored outside, or has been subject to misuse, negligence, accident and/or has not been installed in accordance with installation instructions.”*

For the **“material and workmanship”** warranty to be valid after the product is installed, requires that the electrofusion product be installed correctly by field technicians properly trained, using approved tooling and procedures in accordance with a manufacturer's factory qualified electrofusion procedure that complies with procedures published by the Plastic Pipe Institute.

- **MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Small Polyethylene (PE) Pipe (MAB-01-2017, or**
- **MAB Generic Electrofusion Procedure for Field Joining of 14 Inch to 30 Inch Polyethylene (PE) Pipe (MAB-02-2017)**

### (2) Electrofusion Training Requirements

For the installation of electrofusion fittings in applications smaller than 24" EF Couplers, Integrity Fusion Products **requires the following** for fusion technicians installing our electrofusion fittings.

Electrofusion Fusion Technicians must:

- have a strong working knowledge of polyethylene and heat fusion.
- have received training from Integrity Fusion Products **or another electrofusion fitting manufacturers authorized electrofusion instructor.**
- have a **valid and current training certificate** from that authorized electrofusion manufacturer or instructor.
- have proven their understanding of these requirements by making the required ASTM F1055 qualified electrofusion assemblies that have been successfully qualified by ASTM F1055 destructive testing methods.

***Non-compliance, deviation, or modification to any of the “qualified” electrofusion fitting manufacturers, or PPI’s published electrofusion procedures automatically invalidates the electrofusion product warranty.***

### (3) Equipment Compatibility

IntegriFuse electrofusion fittings, **other than electrofusion couplers 24” and larger**, are capable of being fused with the IntegriFuse I60, IntegriFuse I105, or other electrofusion processors, with no problem. The installation of electrofusion IntegriFuse electrofusion couplers **24” and larger**, ***requires the exclusive use of the IntegriFuse I105 processor.***

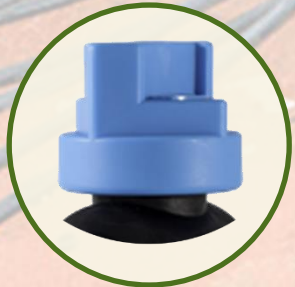
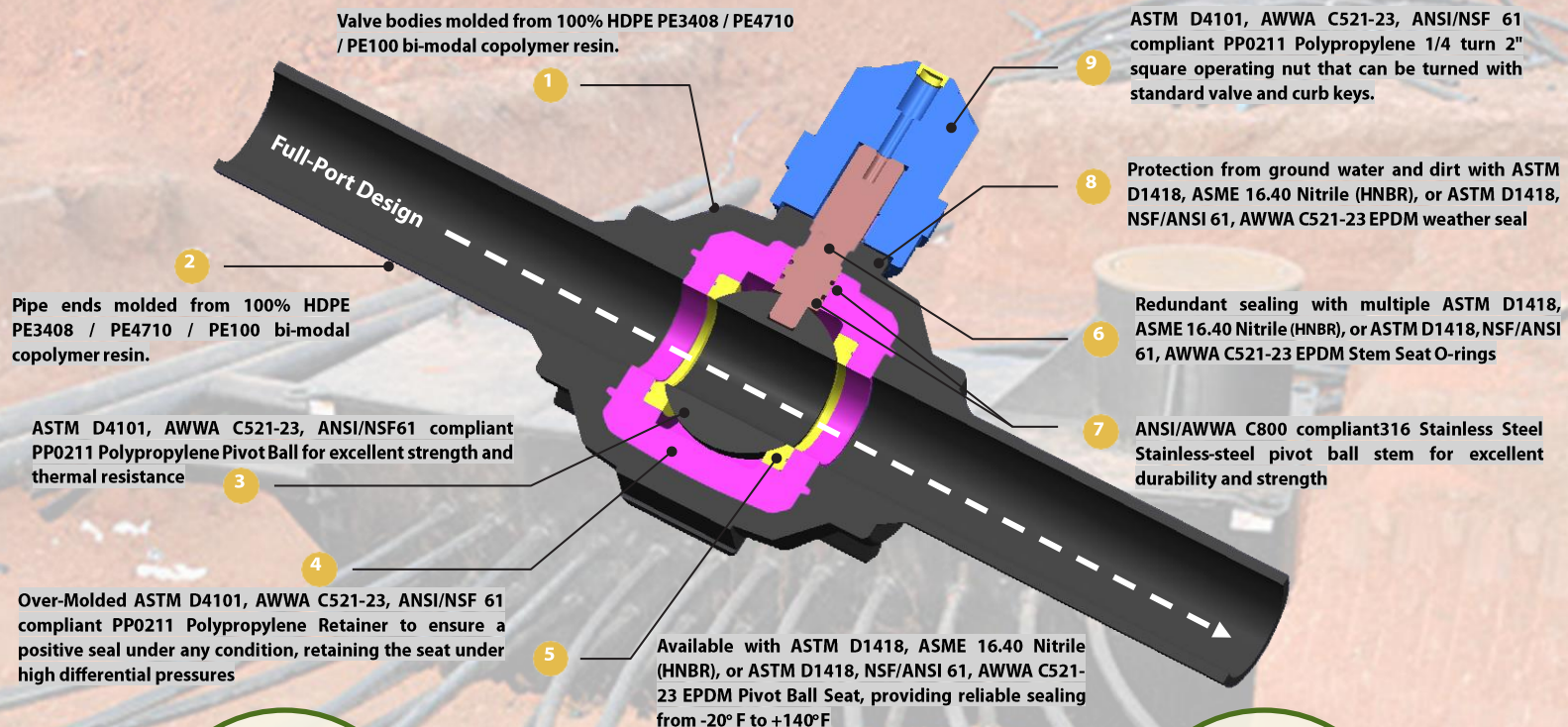
# INTEGRITY Fusion Products, Inc.

## Molded Polyethylene Ball Valves

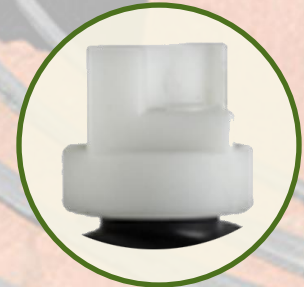
Integrity Fusion Products is proud to offer a line of **IntegriFuse Polyethylene Ball Valves**, that are unlike any other polyethylene ball valve currently available on the market. Manufactured using our own **patent-pending** design, our **full-port, 1-piece Polyethylene Ball Valve body** design, increases the valves strength, durability, and reliability - making it ideal for meeting the rugged demands found in most potable water, golf course, irrigation, natural gas, industrial, and landfill applications.

Currently available in **3/4" IPS to 6" IPS** sizes, **IntegriFuse Injection Molded Polyethylene Ball Valves** are all manufactured and tested to meet the requirements of **ASTM D2513, ASTM D3261, NSF/ANSI 61, ANSI/AWWA C901, C906, C521, and ASME 16.40**, and available in two "seat" and "stem", and "weather seal" options (**Option 1: Blue Cap Valves = NSF/ANSI 61, AWWA C521-23, ASTM D4101 EPDM Seals for potable water applications, and Option 2: White Cap Valves = ASTM D4101, ASME 16.40 HNBR/Nitrile Seals for gas, industrial, landfill, and other non-potable water applications**); designed for **Butt Fusion** or **Electrofusion** to outside diameter-controlled pipe and fittings (**molded or fabricated**) conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**.

### The industry's first one-piece injection molded valve body



Blue Cap on Valves = ASTM D1418, NSF/ANSI 61, AWWA C521-23, EPDM Seals  
Most commonly used in potable water applications



White Cap on Valves = ASME 16.40, ASTM D1418 HNBR/Nitrile Seals  
Most commonly used in Gas, Industrial, Landfill, Golf Courses, and other non-potable water applications

**Molded Full-Port Polyethylene Ball Valves** manufactured by Integrity Fusion Products, are injection over-molded **High-Density Polyethylene valves** that are designed and manufactured for use in applications that include, but are not limited to:

- *Municipal water distribution & service lines*
- *Wastewater conveyance*
- *Irrigation*
- *Oil and Gas Production*
- *Industrial piping applications*
- *Process Lines*
- *Mining*
- *Landfill*



### **POLYETHYLENE VALVE BODY:**

**Integrity Fusion Products Polyethylene Ball Valve bodies** are manufactured from virgin, NSF listed, pre-blended, bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**, and can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**.

### **INTERNAL RETAINERS – PIVOT BALLS and OPERATING NUTS:**

The over-molded **Full-Port Pivot Balls and Pivot Ball Retainers**, and the external **Square Operating Nuts** are produced from virgin **Polypropylene** resin that has a designated cell class of PP0211 that complies with all requirements of **ASTM D4101, AWWA C521, and ANSI/NSF/CAN 61**.

### **INTERNAL PIVOT BALL SEATS – STEM SEATS and WEATHER SEALS:**

IntegriFuse Polyethylene Ball Valves come available with a choice of either **EPDM**, or **Nitrile (HNBR)** internal Pivot Ball Seats, Stem Seats, and Weather Seals. **IntegriFuse Polyethylene Ball Valves** manufactured with **EPDM** material is visually designated with **Blue Polypropylene Square Operating Caps**. The **EPDM** material used in IntegriFuse Poly Ball Valves is **ASTM D1418, NSF/ANSI/CAN 61, AWWA C521** compliant, and provides reliable sealing from **-20° F to +140° F**. **IntegriFuse Polyethylene Ball Valves** with **EPDM** seats are designated and approved for use in potable water systems. IntegriFuse Polyethylene Ball Valves manufactured with **Nitrile (HNBR) seats**, are much more resistant to heat, ozone, and abrasion than **EPDM seats**, and are designed and approved for use in more aggressive, non-potable water applications such as; oil and gas, industrial, chemical, food and pharma. **IntegriFuse Polyethylene Ball Valves** with **Nitrile (HNBR) seals** are **ASTM D1418, ASME 16.40** compliant, and are visually designated with **White Polypropylene Square Operating Caps**.

### **STAINLESS-STEEL PIVOT BALL STEMS**

The **Stainless-Steel Pivot Ball Stems** are designed to provide excellent strength and durability, and manufactured from **ANSI/AWWA C800** compliant **316 Stainless Steel**.

**IntegriFuse Full-Port Polyethylene Ball Valves** are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

- ASTM D2513 - Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- ASTM D3350 - Specification for Polyethylene Plastic Pipes and Fittings Materials
- ASTM D3261 - Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
- ASTM D4101 - Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials
- AWWA C901 - Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service
- AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks
- AWWA C521 - Plastic Ball Valves
- ANSI/NSF 61 - Plastic Piping System Components & Related Materials



## Conditions for the Required De-Rating of a Transition Fitting Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings **must be de-rated for elevated temperatures in all service applications**, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR Title 49 Part 192 regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

*API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0*

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings **should not exceed 140° F.** (TABLE 2)

Fitting MAOP by SDR vs. Operating Temperature				
SDR	73.4° F	100° F	120° F	140° F
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

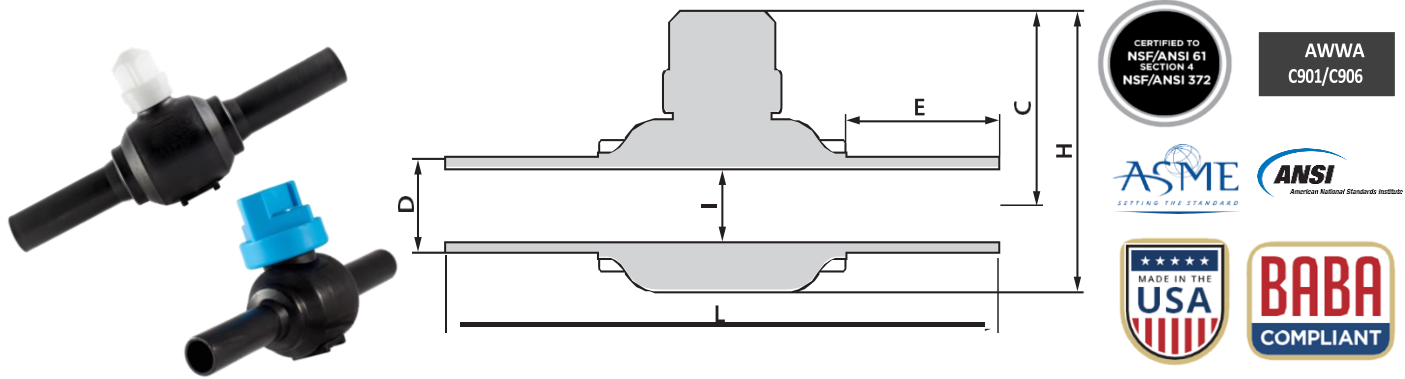
MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	73.4° F	100° F	120° F	140° F
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

*Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5*

## Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	1.0
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR Title 49 part 192)	1.0
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	.5
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	.5



<b>Product Family:</b>	Injection Molded Poly Ball Valve	<b>Fitting Design:</b>	Over Molderd - Full Port
<b>Resin Status:</b>	NSF Listed Bi-Modal Virgin Resin	<b>Nominal Base Sizes:</b>	3/4" – 6"
<b>Resin Type:</b>	ASTM D3350 designated PE3408/PE4710/PE100	<b>Nominal Pipe Standard:</b>	IPS
<b>Resin Cell Class:</b>	4455574-CC3	<b>Currently Available SDR's:</b>	11
<b>PP Retainer, Pivot Ball &amp; Operating Nut Cap</b>	PP0211 Resin complies with ASTM D4101, ANSI/AWWA C521, NSF/ANSI 61	<b>EPDM Seals:</b>	ASTM D1418, NSF / ANSI 61, AWWA C521
<b>Stainless Steel Stem</b>	ANSI/AWWA C800 316 Stainless Steel	<b>Nitrile (HNBR) Seals:</b>	ASTM D1418, Meets ASME 16.40 Requirements
<b>Manufactured and tested to meet requirements of:</b>		ASTM F1055, ASTM D2513, ASTM D3261, ANSI/AWWA C901, C906, C521, and NSF 61	
<b>For use on pipe and fittings conforming to:</b>		ASTM D2513, ASTM D3035, ASTM F-714	

## IPS w/EPDM Seals

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	D [in.]	L [in.]	H [in.]	C [in.]	E [in.]	I [ins.]	CV	Weight (lbs.)	Item Code
3/4"	1.050	11.50	5.12	3.70	3.62	1.06	32	1.1	500009
1"	1.315	11.50	5.12	3.70	3.62	1.06	50	1.1	500010
1 1/4"	1.660	11.50	5.12	3.70	3.62	1.06	79	1.1	500008
1 1/2"	1.900	11.81	5.51	3.78	3.15	1.26	104	1.7	500011
2"	2.375	19.53	9.65	7.01	6.69	1.77	164	4.6	500021
3"	3.500	21.18	11.81	8.50	6.69	2.52	375	8.8	500012
4"	4.500	24.02	14.92	10.39	6.69	3.58	591	14.7	500013
6"	6.620	31.04	20.55	14.21	7.00	4.98	TBD	TBD	500027

*NOTE: Valves with Blue Caps indicate they have EPDM seals that are designed and approved for use in potable water applications*

## IPS w/Nitrile (HNBR) Seals

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	D [in.]	L [in.]	H [in.]	C [in.]	E [in.]	I [ins.]	CV	Weight (lbs.)	Item Code
3/4"	1.050	11.50	5.12	3.70	3.62	1.06	32	1.1	500000
1"	1.315	11.50	5.12	3.70	3.62	1.06	50	1.1	500001
1 1/4"	1.660	11.50	5.12	3.70	3.62	1.06	79	1.1	500002
1 1/2"	1.900	11.81	5.51	3.78	3.15	1.26	104	1.7	500003
2"	2.375	19.53	9.65	7.01	6.69	1.77	164	4.6	500005
3"	3.500	21.18	11.81	8.50	6.69	2.52	375	8.8	500006
4"	4.500	24.02	14.92	10.39	6.69	3.58	591	14.7	500007
6"	6.620	31.04	20.55	14.21	7.00	4.98	TBD	TBD	500026

*NOTE: Valves with White Caps indicate they have HNBR/Nitrile seals that are designed and approved for use in gas & other non-potable water applications*

# INTEGRITY Fusion Products, Inc.

## HDPE to Steel Transition Fittings

Integrity Fusion Products manufactures a full line of **Standard and Heavy-Duty Epoxy Coated Carbon Steel** and **Standard Stainless Steel**, HDPE Transition Fittings in a variety of sizes, configurations, SDR's. Current Transition offerings meet or exceed all **ASTM D2513 Cat.3** mechanical joint requirements, with **Cat.1 Transition Fittings to be released soon.** (**Cat.3 Transition Fittings CANNOT be used in natural gas applications**). Integrity Fusion Products Transitioning Fittings are manufactured in a variety of nominal pipe sizes and SDR's and are tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714.**



**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- *Municipal water distribution & service lines*
- *Wastewater conveyance*
- *Irrigation*
- *Geothermal*
- *Industrial piping applications*
- *Process Lines*
- *Mining*
- *Landfill*
- *Oil and gas production*
- *Saltwater Disposal*
- *Dredging*
- *Telecom Conduit*

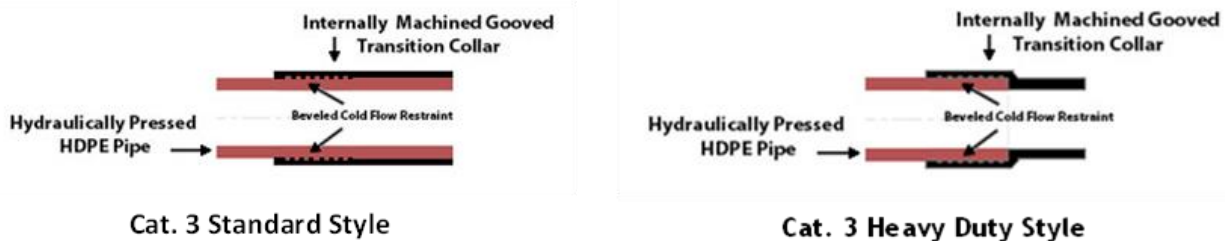
Integrity Fusion Products manufactures a full line of **Epoxy Coated Carbon Steel and Stainless Steel to HDPE Transition Fittings** in a variety of sizes, configurations, SDR's that meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**). Integrity Fusion Products Transitioning Fittings are manufactured in a variety of nominal pipe sizes and SDR's and are tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**.

**PIPE:**

**Integrity Fusion Products Transitioning Fittings** are manufactured using pipe stock produced from virgin, pre-blended, bi-modal black high density polyethylene resin that has a cell classification of **445574C-CC3** that conforms to **ASTM D3350** and is recognized by the Plastic Pipe Institute as having a **PE3408 / PE4710 / PE100** rating with an **HDB** (Hydrostatic Design Basis) of **1600 psi @ 73° F**, and can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**.

**TRANSITION COLLAR:**

The internally machined and beveled groove design in our **Epoxy Coated Carbon ASTM A53/API-5 Steel, and ASTM A249 or ASTM A269 304 Stainless Steel or 316 Stainless Steel Transition Collars**, provides a robust mechanical joint allowing it to work at the MAOP of the inserted HDPE pipes SDR. **Standard Transition Fittings** provide complete, unobstructed HDPE coverage through the ID of the transition collar, while the **Heavy-Duty Transition Fittings are Epoxy Coated internally and externally**, with both designs providing you with a **piggable seal**, and total corrosion protection. All NPT threads are made to **ANSI/ASME B1.20.1**, and the Standard Machine Groove to **ASME B31.1**.



**Transition Fittings** from Integrity Fusion Products are manufactured, tested, certified, and listed in accordance with standards and requirements that meet a wide range of project requirements that include:

- ASTM D2513 - Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- ASTM D3350 - Specification for Polyethylene Plastic Pipes and Fittings Materials
- ASTM D3261 - Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Pipe and Tubing
- ASTM F714 - Specifications for HDPE Pipe Dimensions
- AWWA C901 - Polyethylene (Pe) Pressure Pipe and Tubing, 3/4 In. Through 3 In. For Water Service
- AWWA C906 - Polyethylene (Pe) Pressure Pipe and Tubing, 4 In. Through 65 In. For Water Works
- ANSI/NSF 61 - Plastic Piping System Components & Related Materials

## Conditions for the Required De-Rating of a Transition Fitting Fittings MAOP

The **Maximum Allowable Operating Pressures (MAOP)** for molded PE4710 fittings **must be de-rated for elevated temperatures in all service applications**, including Oil & Gas Gathering Systems installed in Class 1 or Class 2 locations (low population areas not subject to DOT CFR Title 49 Part 192 regulations) or where Federal Codes do not apply. *Including Water, Brine, Dry Natural Gas applications with NO associated hydrocarbons.*

*API Specification 15LE (1995) states "In most circumstances, the HDB obtained at 73° F can be used for applications up to 100° F without further derating" Values in this table use a material design factor of .63 and a Fluid Service Factor of 1.0*

The maximum operating temperature of Integrity Fusion Products PE4710 Molded Fittings **should not exceed 140° F.** (TABLE 2)

Fitting MAOP by SDR vs. Operating Temperature				
SDR	73.4° F	100° F	120° F	140° F
7	333 psi	260 psi	210 psi	166 psi
9	250 psi	195 psi	158 psi	125 psi
11	200 psi	156 psi	126 psi	100 psi
17	125 psi	98 psi	79 psi	63 psi

TABLE 2

Dry, gaseous hydrocarbons have no adverse effect on our molded fittings normal expected service life, and naturally occurring chemicals in the soil will not attack or cause our fittings to degrade. They do not rust, rot, or corrode; they naturally resist the buildup of scale and other deposits, and they do not support the growth of algae, bacteria, fungi, or other marine life.

Table 3 provides an added derated MAOP of a molded electrofusion fitting when installed into services and applications subjected to an extended exposure of liquid hydrocarbon concentrations of 2% and greater.

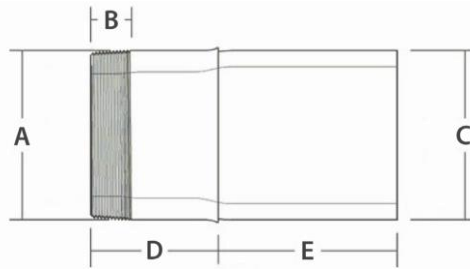
MAOP by SDR Derated for Operating Temperature and Transporting a Media Containing 2% or greater Hydrocarbon Content				
SDR	73.4° F	100° F	120° F	140° F
7	166 psi	129 psi	105 psi	83 psi
9	125 psi	98 psi	79 psi	63 psi
11	100 psi	78 psi	63 psi	50 psi

TABLE 3

*Values in Table 3 use a material design factor of .63 and a Fluid Service Factor of 0.5*

## Fluid Service Factors

Produced Water, Brine, Process Water with no associated liquid hydrocarbons	1.0
Dry Natural Gas (no hydrocarbon liquids used in Class 1 and Class 2 locations and in low population area not subject to DOT CFR Title 49 part 192)	1.0
Crude Oil, Wet Natural Gas, Liquid Hydrocarbons, Process Water with >2% liquid hydrocarbons	.5
Gas Distribution piping that is permeated by solvating chemicals, liquid hydrocarbons or liquified gas condensate	.5

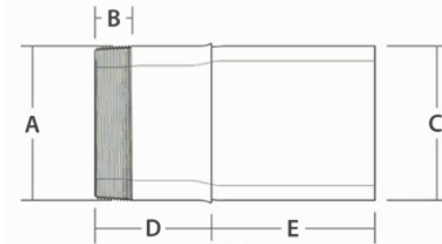


Integrity Fusion Products offers a full line of Standard **ANSI/ASME B1.20.1 NPT** (male MPT or Female FPT), **Epoxy Coated Carbon ASTM A53/API-5 Steel**, and **ASTM A249 or ASTM A269 304 Stainless Steel or 316 Stainless Steel** HDPE Transition Fittings that are **AWWA C116-01 & C213-01** compliant. **Integrity Fusion Products Standard Transition Fittings** provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to work at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. **Integrity Fusion Products Standard Transition Fittings** are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. **Integrity Fusion Standard Transition Fittings** meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. **Integrity Fusion Products Standard Transition Fittings** are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372** (where applicable), for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. **Integrity Fusion Products Standard Transition Fittings** can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. **Integrity Fusion Products Standard Transition Fittings** are also available in a **Standard Cut Groove design**.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE PIPE WRENCHES. Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.



### Male (MIPT) NPT Transitions

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter	B Thread Length	C HDPE Pipe OD	D Steel Collar Length	E Exposed HDPE Length	Weight [lbs.]	Item Code
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400634
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400626
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400630

### Male (MIPT) NPT Transitions

SDR 11 (standard dimension ratio)

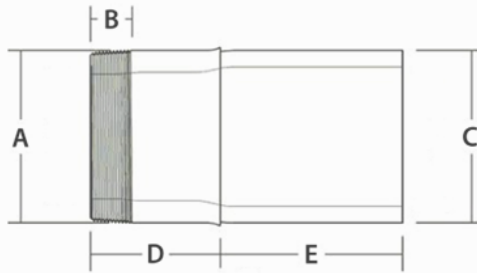
200 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter r [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
¾" IPS	Epoxy	1.050	0.70	10.50	1.80	6.20		400563
	304 Stainless	1.050	0.70	10.50	1.80	6.20		400564
	316 Stainless	1.050	0.70	10.50	1.80	6.20		400571
1" IPS	Epoxy	1.315	0.99	1.315	2.00	6.00		400577
	304 Stainless	1.315	0.99	1.315	2.00	6.00		400573
	316 Stainless	1.315	0.99	1.315	2.00	6.00		400575
1 ¼" IPS	Epoxy	1.660	1.01	1.660	2.60	5.40		400583
	304 Stainless	1.660	1.01	1.660	2.60	5.40		400579
	316 Stainless	1.660	1.01	1.660	2.60	5.40		400581
1 ½" IPS	Epoxy	1.900	1.03	1.900	2.60	5.40		400586
	304 Stainless	1.900	1.03	1.900	2.60	5.40		400585
	316 Stainless	1.900	1.03	1.900	2.60	5.40		400614
2" IPS	Epoxy	2.375	1.06	2.375	3.00	5.00		400593
	304 Stainless	2.375	1.06	2.375	3.00	5.00		400587
	316 Stainless	2.375	1.06	2.375	3.00	5.00		400590
3" IPS	Epoxy	3.500	1.26	3.500	4.00	4.00		400602
	304 Stainless	3.500	1.26	3.500	4.00	4.00		400596
	316 Stainless	3.500	1.26	3.500	4.00	4.00		400599
4" IPS	Epoxy	4.500	1.48	4.500	4.00	8.00		400611
	304 Stainless	4.500	1.48	4.500	4.00	8.00		400605
	316 Stainless	4.500	1.48	4.500	4.00	8.00		400608
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400633
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400625
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400629

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE TRADITIONAL PIPE WRENCHES (only use strap wrenches).** Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. **Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.

# Standard Male NPT Transition Fitting

## Specification & Dimension Sheet



### Male (MIPT) NPT Transitions

SDR 9 (standard dimension ratio)

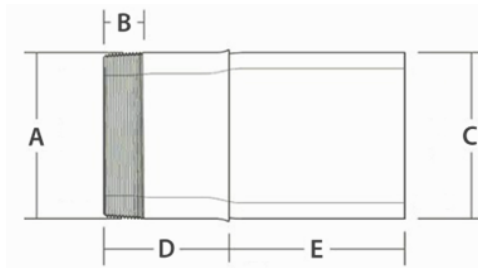
255 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
1" IPS	Epoxy	1.315	0.99	1.315	2.00	6.00		400578
	304 Stainless	1.315	0.99	1.315	2.00	6.00		400574
	316 Stainless	1.315	0.99	1.315	2.00	6.00		400576
1 1/4" IPS	Epoxy	1.660	1.01	1.660	2.60	5.40		400584
	304 Stainless	1.660	1.01	1.660	2.60	5.40		400580
	316 Stainless	1.660	1.01	1.660	2.60	5.40		400582
2" IPS	Epoxy	2.375	1.06	2.375	3.00	5.00		400595
	304 Stainless	2.375	1.06	2.375	3.00	5.00		400589
	316 Stainless	2.375	1.06	2.375	3.00	5.00		400592
3" IPS	Epoxy	3.500	1.26	3.500	4.00	4.00		400604
	304 Stainless	3.500	1.26	3.500	4.00	4.00		400598
	316 Stainless	3.500	1.26	3.500	4.00	4.00		400601
4" IPS	Epoxy	4.500	1.48	4.500	4.00	8.00		400613
	304 Stainless	4.500	1.48	4.500	4.00	8.00		400607
	316 Stainless	4.500	1.48	4.500	4.00	8.00		400610
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400636
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400628
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400632

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE TRADITIONAL PIPE WRENCHES (only use strap wrenches).** Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling. Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.







### Male (MIPT) NPT Transitions

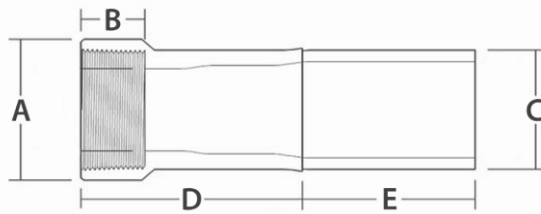
SDR 7 (standard dimension ratio)

355 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter (in.)	B Thread Length (in.)	C HDPE Pipe OD (in.)	D Steel Collar Length (in.)	E Exposed HDPE Length (in.)	Weight [lbs.]	Item Code
1" IPS	Epoxy	1.315	0.99	1.315	2.00	6.00		400617
	304 Stainless	1.315	0.99	1.315	2.00	6.00		400621
	316 Stainless	1.315	0.99	1.315	2.00	6.00		400616
1 1/4" IPS	Epoxy	1.660	1.01	1.660	2.60	5.40		400620
	304 Stainless	1.660	1.01	1.660	2.60	5.40		400618
	316 Stainless	1.660	1.01	1.660	2.60	5.40		400619
2" IPS	Epoxy	2.375	1.06	2.375	3.00	5.00		400594
	304 Stainless	2.375	1.06	2.375	3.00	5.00		400588
	316 Stainless	2.375	1.06	2.375	3.00	5.00		400591
3" IPS	Epoxy	3.500	1.26	3.500	4.00	4.00		400603
	304 Stainless	3.500	1.26	3.500	4.00	4.00		400597
	316 Stainless	3.500	1.26	3.500	4.00	4.00		400600
4" IPS	Epoxy	4.500	1.48	4.500	4.00	8.00		400612
	304 Stainless	4.500	1.48	4.500	4.00	8.00		400606
	316 Stainless	4.500	1.48	4.500	4.00	8.00		400609
6" IPS	Epoxy	6.625	1.56	6.625	5.00	8.00		400635
	304 Stainless	6.625	1.56	6.625	5.00	8.00		400627
	316 Stainless	6.625	1.56	6.625	5.00	8.00		400631

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE TRADITIONAL PIPE WRENCHES (only use strap wrenches).** Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling. Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.



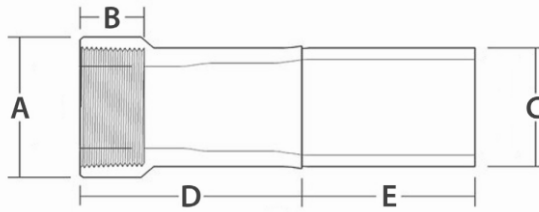


Integrity Fusion Products offers a full line of Standard **ANSI/ASME B1.20.1 NPT** (male MPT or Female FPT), **Epoxy Coated Carbon ASTM A53/API-5 Steel**, and **ASTM A249 or ASTM A269 304 Stainless Steel or 316 Stainless Steel** HDPE Transition Fittings that are **AWWA C116-01 & C213-01** compliant. **Integrity Fusion Products Standard Transition Fittings** provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to operate at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. **Integrity Fusion Products Standard Transition Fittings** are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. **Integrity Fusion Standard Transition Fittings** meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. **Integrity Fusion Products Standard Transition Fittings** are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372** (where applicable), for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. **Integrity Fusion Products Standard Transition Fittings** can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. **Integrity Fusion Products Standard Transition Fittings** are also available in a **Standard Cut Groove design**.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE PIPE WRENCHES (only use strap wrenches). Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.



### Female (FIPT) NPT Transitions

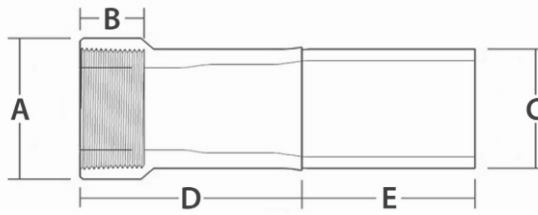
SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
¾" IPS	Epoxy	1.240	0.70	1.050	2.20	5.80		400502
	304 Stainless	1.240	0.70	1.050	2.20	5.80		400500
	316 Stainless	1.240	0.70	1.050	2.20	5.80		400501
1" IPS	Epoxy	1.485	0.91	1.315	2.60	5.40		400507
	304 Stainless	1.485	0.91	1.315	2.60	5.40		400503
	316 Stainless	1.485	0.91	1.315	2.60	5.40		400505
1 ¼" IPS	Epoxy	1.900	0.89	1.660	3.40	4.60		400513
	304 Stainless	1.900	0.89	1.660	3.40	4.60		400509
	316 Stainless	1.900	0.89	1.660	3.40	4.60		400511
1 ½" IPS	Epoxy	2.250	0.85	1.900	3.40	4.60		400516
	304 Stainless	2.250	0.85	1.900	3.40	4.60		400515
	316 Stainless	2.250	0.85	1.900	3.40	4.60		400615
2" IPS	Epoxy	2.750	1.00	2.375	3.40	4.60		400523
	304 Stainless	2.750	1.00	2.375	3.40	4.60		400517
	316 Stainless	2.750	1.00	2.375	3.40	4.60		400520
3" IPS	Epoxy	4.144	1.62	3.500	4.38	3.62		400532
	304 Stainless	4.144	1.62	3.500	4.38	3.62		400526
	316 Stainless	4.144	1.62	3.500	4.38	3.62		400529
4" IPS	Epoxy	5.160	1.88	4.500	4.62	7.38		400541
	304 Stainless	5.160	1.88	4.500	4.62	7.38		400535
	316 Stainless	5.160	1.88	4.500	4.62	7.38		400538

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE PIPE WRENCHES (only use strap wrenches). Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.





## Female (FIPT) NPT Transitions

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4°F)

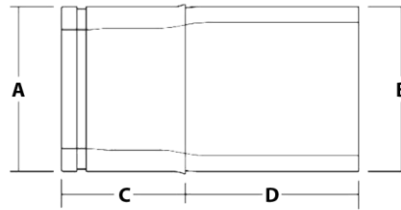
Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
1" IPS	Epoxy	1.485	0.91	1.315	2.60	5.40		400508
	304 Stainless	1.485	0.91	1.315	2.60	5.40		400504
	316 Stainless	1.485	0.91	1.315	2.60	5.40		400506
1 1/4" IPS	Epoxy	1.900	0.89	1.660	3.40	4.60		400514
	304 Stainless	1.900	0.89	1.660	3.40	4.60		400510
	316 Stainless	1.900	0.89	1.660	3.40	4.60		400512
2" IPS	Epoxy	2.750	1.00	2.375	3.40	4.60		400525
	304 Stainless	2.750	1.00	2.375	3.40	4.60		400519
	316 Stainless	2.750	1.00	2.375	3.40	4.60		400522
3" IPS	Epoxy	4.144	1.62	3.500	4.38	3.62		400534
	304 Stainless	4.144	1.62	3.500	4.38	3.62		400528
	316 Stainless	4.144	1.62	3.500	4.38	3.62		400531
4" IPS	Epoxy	5.160	1.88	4.500	4.62	7.38		400543
	304 Stainless	5.160	1.88	4.500	4.62	7.38		400537
	316 Stainless	5.160	1.88	4.500	4.62	7.38		400540

## Female (FIPT) NPT Transitions

SDR 7 (standard dimension ratio)

355 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar Epoxy or Stainless	A Thread Diameter [in.]	B Thread Length [in.]	C HDPE Pipe OD [in.]	D Steel Collar Length [in.]	E Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
1" IPS	Epoxy	1.485	0.91	1.315	2.60	5.40		400642
	304 Stainless	1.485	0.91	1.315	2.60	5.40		400640
	316 Stainless	1.485	0.91	1.315	2.60	5.40		400641
1 1/4" IPS	Epoxy	1.900	0.89	1.660	3.40	4.60		400645
	304 Stainless	1.900	0.89	1.660	3.40	4.60		400643
	316 Stainless	1.900	0.89	1.660	3.40	4.60		400644
2" IPS	Epoxy	2.750	1.00	2.375	3.40	4.60		400524
	304 Stainless	2.750	1.00	2.375	3.40	4.60		400518
	316 Stainless	2.750	1.00	2.375	3.40	4.60		400521
3" IPS	Epoxy	4.144	1.62	3.500	4.38	3.62		400533
	304 Stainless	4.144	1.62	3.500	4.38	3.62		400527
	316 Stainless	4.144	1.62	3.500	4.38	3.62		400530
4" IPS	Epoxy	5.160	1.88	4.500	4.62	7.38		400542
	304 Stainless	5.160	1.88	4.500	4.62	7.38		400536
	316 Stainless	5.160	1.88	4.500	4.62	7.38		400539



Integrity Fusion Products offers a full line of Standard, **Epoxy Coated Carbon ASTM A53/API-5 Steel** HDPE Transition Fittings that are **AWWA C116-01 & C213-01** compliant. **Integrity Fusion Products Standard Transition Fittings** provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to operate at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. **Integrity Fusion Products Standard Transition Fittings** are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. **Integrity Fusion Standard Transition Fittings** meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. **Integrity Fusion Products Standard Transition Fittings** are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. **Integrity Fusion Products Standard Transition Fittings** can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

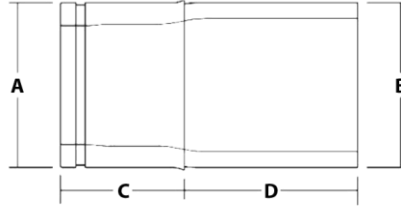
- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit

## Machine Grooved Transitions

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	A Collar Dia. [in.]	B HDPE Pipe OD [in.]	C Steel Collar Length [in.]	D Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
6" IPS	Epoxy	6.625	6.625	5.00	8.00		400551
8" IPS	Epoxy	8.625	8.625	7.00	8.00		400555
10" IPS	Epoxy	10.75	10.75	8.00	8.00		400559
12" IPS	Epoxy	12.75	12.75	9.00	9.00		400561



## Machine Grooved Transitions

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	Transition Collar	A Collar Diameter [in.]	B HDPE Pipe OD [in.]	C Steel Collar Length [in.]	D Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
3" IPS	Epoxy	3.500	3.500	4.00	4.00		400544
4" IPS	Epoxy	4.500	4.500	4.00	4.00		400547
6" IPS	Epoxy	6.625	6.625	5.00	8.00		400550
8" IPS	Epoxy	8.625	8.625	7.00	8.00		400554
10" IPS	Epoxy	10.75	10.75	8.00	8.00		400558
12" IPS	Epoxy	12.75	12.75	9.00	9.00		400560

## Machine Grooved Transitions

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

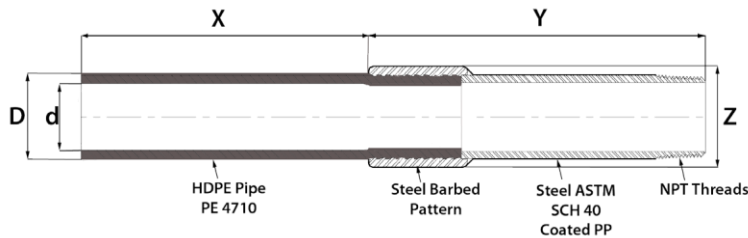
Nominal Size	Transition Collar	A Collar Diameter [in.]	B HDPE Pipe OD [in.]	C Steel Collar Length [in.]	D Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
3" IPS	Epoxy	3.500	3.500	4.00	4.00		400546
4" IPS	Epoxy	4.500	4.500	4.00	4.00		400549
6" IPS	Epoxy	6.625	6.625	5.00	8.00		400553
8" IPS	Epoxy	8.625	8.625	7.00	8.00		400557
10" IPS	Epoxy	10.75	10.75	8.00	8.00		400562

## Machine Grooved Transitions

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4° F)

Nominal Size	Transition Collar	A Collar Diameter [in.]	B HDPE Pipe OD [in.]	C Steel Collar Length [in.]	D Exposed HDPE Length [in.]	Weight [lbs.]	Item Code
3" IPS	Epoxy	3.500	3.500	4.00	4.00		400545
4" IPS	Epoxy	4.500	4.500	4.00	4.00		400548
6" IPS	Epoxy	6.625	6.625	5.00	8.00		400552
8" IPS	Epoxy	8.625	8.625	7.00	8.00		400556

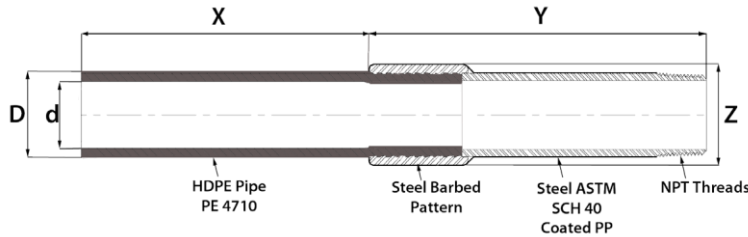


Integrity Fusion Products offers a full line of **Heavy-Duty ANSI/ASME B1.20.1 Male NPT, Internally and Externally Epoxy Coated ASTM A106/A5 Schedule 40 Carbon Steel HDPE Transition Fittings**. *Integrity Fusion Products Heavy-Duty Transition Fittings* provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to operate at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. *Integrity Fusion Products Heavy-Duty Transition Fittings* are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. *Integrity Fusion Heavy-Duty Transition Fittings* meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. *Integrity Fusion Products Heavy-Duty Transition Fittings* are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. *Integrity Fusion Products Heavy-Duty Transition Fittings* can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. *Integrity Fusion Products Heavy-Duty Transition Fittings* are also available in a **Heavy-Duty Weld-End** and **Heavy-Duty Cut Groove** design.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit

**NOTE:** When installing the standard transition fitting, the installer should always use pipe joint sealant or Teflon tape on the threads. First, hand tighten the transition fitting and then use two (2) strap wrenches to tighten the transition fitting the rest of the way. **DO NOT USE PIPE WRENCHES (only use strap wrenches). Pipe wrenches can deform the transition sleeve and result in compromising the seal created between the tightly pressed pipe and internally machined and beveled grooves creating a potential leak path. Over tightening may also damage the transition collar a cause ovality or damage. Always pressure test for leaks before backfilling.** Backfill and compact carefully around transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.



### Male (MIPT) NPT Transitions

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
6" IPS	Epoxy	10.54	7.70	6.625	5.845	6.95	17.1	400736

### Male (MIPT) NPT Transitions

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.36	5.84	2.375	1.943	2.64	2.4	400709
3" IPS	Epoxy	8.87	6.80	3.500	2.864	3.76	5.2	400712
4" IPS	Epoxy	11.43	7.39	4.50	3.682	4.78	8.3	400715
6" IPS	Epoxy	10.54	7.70	6.625	5.421	6.95	18.3	400733

### Male (MIPT) NPT Transitions

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.36	5.84	2.375	1.943	2.64	2.6	400711
3" IPS	Epoxy	8.87	6.80	3.500	2.864	3.76	5.5	400714
4" IPS	Epoxy	11.43	7.39	4.50	3.682	4.78	9.9	400717
6" IPS	Epoxy	10.54	7.70	6.625	5.421	6.95	19.6	400734

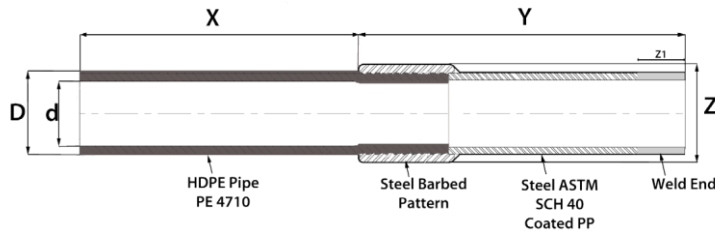
### Male (MIPT) NPT Transitions

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.36	5.84	2.375	1.943	2.64	2.8	400710
3" IPS	Epoxy	8.87	6.80	3.500	2.864	3.76	6.0	400713
4" IPS	Epoxy	11.43	7.39	4.50	3.682	4.78	10.7	400716
6" IPS	Epoxy	10.54	7.70	6.625	5.421	6.95	21.3	400735





Integrity Fusion Products offers a full line of **Heavy-Duty Internally and Externally Epoxy Coated, Weld-End ASTM A106/A5 Schedule 40 Carbon Steel** HDPE Transition Fittings. *Integrity Fusion Products Heavy-Duty Transition Fittings* provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to work at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. *Integrity Fusion Products Heavy-Duty Transition Fittings* are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. *Integrity Fusion Heavy-Duty Transition Fittings* meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**this fitting CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. *Integrity Fusion Products Heavy-Duty Transition Fittings* are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. *Integrity Fusion Products Heavy-Duty Transition Fittings* can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. *Integrity Fusion Products Heavy-Duty Transition Fittings* are also available in a **Heavy-Duty Thread End** and **Heavy-Duty Cut Groove** design.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings that are designed and manufactured for use in applications that include, but are not limited to:

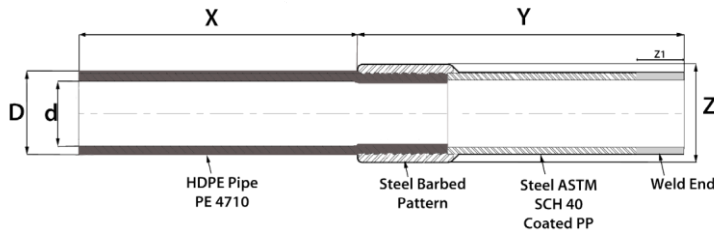
- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit

## Weld-End Transitions

SDR 17 (standard dimension ratio)

125 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Z1 Uncoated Weld Zone	Weight [lbs.]	Item Code
6" IPS	Epoxy	13.05	17.88	6.625	5.845	7.08	2.0	44.2	400737
8" IPS	Epoxy	11.72	22.82	8.625	7.611	9.81	2.0	89.1	400738



### Weld-End Transitions

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4°F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Z1 Uncoated Weld Zone	Weight [lbs.]	Item Code
2" IPS	Epoxy	15.52	13.76	2.375	1.943	3.00	2.0	7.7	400718
3" IPS	Epoxy	15.23	17.84	3.500	2.864	4.03	2.0	13.6	400721
4" IPS	Epoxy	15.12	17.92	4.500	3.682	5.28	2.0	22.7	400724
6" IPS	Epoxy	13.05	17.88	6.625	5.421	7.08	2.0	46.2	400727
8" IPS	Epoxy	11.72	22.82	8.625	7.057	9.81	2.0	92.6	400730

### Weld-End Transitions

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4°F)

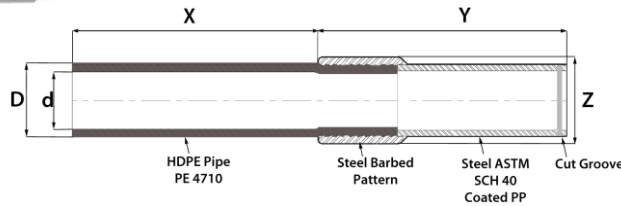
Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Z1 Uncoated Weld Zone	Weight [lbs.]	Item Code
2" IPS	Epoxy	15.52	13.76	2.375	1.943	3.00	2.0	7.9	400720
3" IPS	Epoxy	15.23	17.84	3.500	2.864	4.03	2.0	13.9	400723
4" IPS	Epoxy	15.12	17.92	4.500	3.682	5.28	2.0	23.3	400726
6" IPS	Epoxy	13.05	17.88	6.625	5.421	7.08	2.0	47.5	400729
8" IPS	Epoxy	11.72	22.82	8.625	7.057	9.81	2.0	94.6	400732

### Weld-End Transitions

SDR 7 (standard dimension ratio)

335 PSI (MAOP @ 73.4°F)

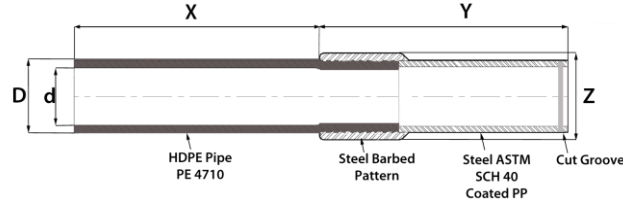
Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Z1 Uncoated Weld Zone	Weight [lbs.]	Item Code
2" IPS	Epoxy	15.52	13.76	2.375	1.943	3.00	2.0	8.1	400719
3" IPS	Epoxy	15.23	17.84	3.500	2.864	4.03	2.0	14.4	400722
4" IPS	Epoxy	15.12	17.92	4.500	3.682	5.28	2.0	24.1	400725
6" IPS	Epoxy	13.05	17.88	6.625	5.421	7.08	2.0	49.2	400728
8" IPS	Epoxy	11.72	22.82	8.625	7.057	9.81	2.0	97.6	400731



Integrity Fusion Products offers a full line of **Heavy-Duty Internally and Externally Epoxy Coated, Groove-End ASTM A106/A5 Schedule 40 Carbon Steel** HDPE Transition Fittings. **Integrity Fusion Products Heavy-Duty Transition Fittings** provide a robust mechanical joint built around an internally machined and beveled groove design, allowing it to work at the MAOP (*maximum allowable operating pressure*) of the inserted HDPE pipes SDR. **Integrity Fusion Products Heavy-Duty Transition Fittings** are designed to provide complete, unobstructed HDPE coverage through the ID of the transition collar for total corrosion protection, providing you with a **piggable** seal plus a pipe restraint rating equivalent to the expected thermal stresses that occur in a pipeline. **Integrity Fusion Heavy-Duty Transition Fittings** meet or exceed the **ASTM D2513 Category 3** mechanical joint requirements (**these fittings CANNOT be used in natural gas applications**) and are manufactured in a variety of nominal pipe sizes and SDR's. **Integrity Fusion Products Heavy-Duty Transition Fittings** are manufactured and tested to meet the requirements of **ASTM D3261, ASTM 1598, ASTM 1599, ANSI/AWWA C901, C906, and NSF/ANSI/ CAN-61, and NSF/ANSI-372 (where applicable)**, for use with outside diameter-controlled pipe and fittings conforming to **ASTM D2513, ASTM D3035, and ASTM F-714**. **Integrity Fusion Products Heavy-Duty Transition Fittings** can be heat fused to any manufacturers' PE pipe, molded fittings, or fabricated fittings manufactured from material made from PE3408 / PE4710 / PE100 resin that complies to **ASTM D3350**. **Integrity Fusion Products Heavy-Duty Transition Fittings** are also available in a **Heavy-Duty Thread End** and **Heavy-Duty Weld-End** design.

**Steel to HDPE Transition Fittings** manufactured by Integrity Fusion Products, are all-purpose, steel to HDPE mechanical transition fittings designed and manufactured for use in applications that include:

- Oil and gas production
- Municipal potable water distribution and service lines
- Saltwater Disposal
- Irrigation
- Mining
- Geothermal
- Dredging
- Wastewater conveyance
- Process Lines
- Industrial piping applications
- Landfill
- Telecom Conduit



### Grooved-End Transitions

SDR 11 (standard dimension ratio)

200 PSI (MAOP @ 73.4° F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.30	5.83	2.375	1.943	2.64	2.4	400700
3" IPS	Epoxy	8.80	6.80	3.500	2.864	3.77	5.4	400703
4" IPS	Epoxy	11.57	7.40	4.500	3.682	4.78	10.3	400706

### Grooved-End Transitions

SDR 9 (standard dimension ratio)

255 PSI (MAOP @ 73.4° F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.30	5.83	2.375	1.943	2.64	2.6	400702
3" IPS	Epoxy	8.80	6.80	3.500	2.864	3.77	5.7	400705
4" IPS	Epoxy	11.57	7.40	4.500	3.682	4.78	10.9	400708

### Grooved-End Transitions

SDR 7 (standard dimension ratio)

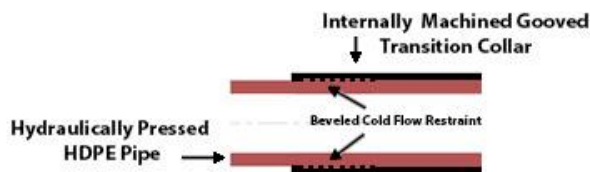
335 PSI (MAOP @ 73.4° F)

Nominal Size	Transition Collar	X Exposed HDPE Length	Y Steel Collar Length	D HDPE Pipe OD	d HDPE Pipe ID	Z Steel Collar Width	Weight [lbs.]	Item Code
2" IPS	Epoxy	9.30	5.83	2.375	1.943	2.64	2.8	400701
3" IPS	Epoxy	8.80	6.80	3.500	2.864	3.77	6.2	400704
4" IPS	Epoxy	11.57	7.40	4.500	3.682	4.78	11.7	400707

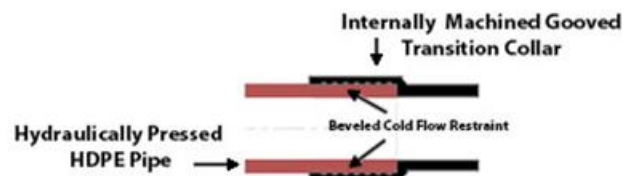
**Epoxy Coated Carbon Steel and Stainless-Steel Transition Fittings** are simple and reliable, and come in a variety of pipe diameters, configurations, SDR's that meet or exceed **ASTM D2513 Category 3** mechanical joint requirements. The Integrity Fusion Products Standard Transition Fitting design utilizes an internally machined and beveled groove on the interior circumference of the transition collar to hold the hydraulically pressed HDPE pipe in place with a robust mechanical joint that allows it to work at the MAOP of the inserted HDPE pipes SDR.



Once the HDPE pipe is hydraulically pressed into the transition collar, the pipe will "cold flow" into the machined grooves and relax, creating an airtight/watertight seal to prevent leakage. When subjected to pressure, the internal operating pressure flowing through the transition fitting will result in more force being placed on the pipe material that cold flowed into the machined grooves, creating stronger connection, and stronger seal between the pipe material and the transition collar.



**Cat. 3 Standard Style**



**Cat. 3 Heavy Duty Style**

## INSTALLATION RECOMMENDATIONS

**HDPE Transition Fitting Pipe Ends:** can be joined with Butt Fusion, Electrofusion or Compression fittings rated for use with HDPE pipe and fittings. All joints should comply with the pipe manufacturer's recommended procedures.

**Standard Transition Threaded Ends:** the installer should always use pipe joint sealant or Teflon tape on the threads, then hand tighten the transition fitting into place. Using two (2) **strap wrenches** - tighten the transition fitting the rest of the way.

**Do not use pipe wrenches when installing Standard Transition Fittings, only use strap wrenches!**

Pipe wrenches will deform the transition collar and compromise the HDPE pipe seal around internally machined grooves and create a potential leak path. Over tightening the transition collar may also cause ovality or damage. Always pressure test for leaks before backfilling. Backfill and compact carefully around the transition and service line to prevent ground shifts which could damage the valve and/or transition fitting.

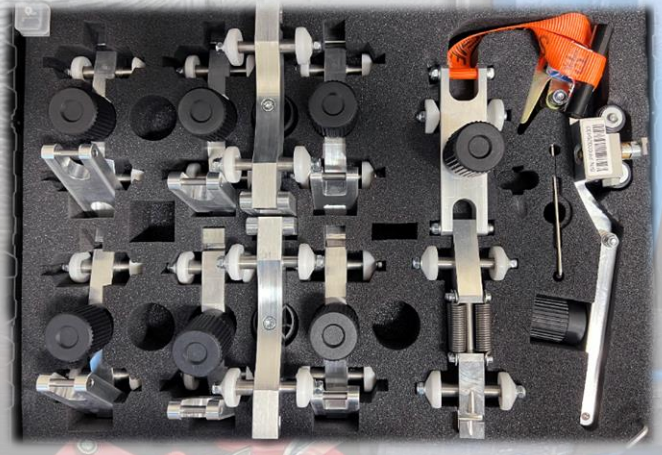


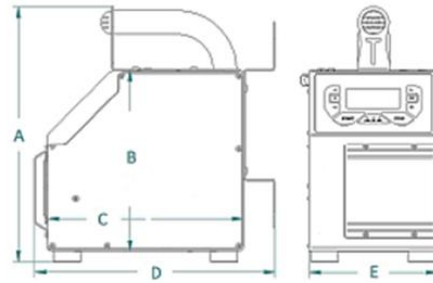
**Heavy Duty Transition Threaded Ends:** the installer should always use pipe joint sealant or Teflon tape on the threads, then hand tighten the transition fitting into place. It is **highly recommended** to use two (2) **strap wrenches** to tighten the transition fitting the rest of the way. However, **pipe wrenches can be used** but care must be taken to not be over-aggressive when tightening the transition and inadvertently break the seal around the internally machined grooves.

# **INTEGRITY** Fusion Products, Inc.

## **EF Processors – Peelers & Re-Rounding Tools**

Integrity Fusion Products offers you everything you need from, pipe surface peelers, to large diameter pipe re-rounding tools, to electrofusion processors; for you to complete your required pipe surface preparation, electrofusion joint assembly, and electrofusion fitting fusion.





The IntegriFuse I-60 and I-105 Electrofusion Processors are next generation Electrofusion control boxes. Both Electrofusion Processor models are **weather resistant** and come included with a wheeled Pelican™ case which provides the processor with enhanced protection during transport. Both Processor units can fuse ALL BRANDS of electrofusion fittings and come equipped with 4.0 mm lead tips and include 4.7 mm Lead Tip Adapters. Both processors can also be retrofitted to include an on-board GPS module that is accurate to within 2.5 meters (8.2 ft.)

The I-60 Processor can fuse a fitting range of ½" to 16" DIPS, and the I-105 Processor can fuse a fitting range of ½" to 63". Both Processors are equipped with improved on-board technology and internal components that allow fusion to take place at higher amperage and are capable of long fusion times and consecutive fusions without overheating. Both Processors have large, intuitive graphic displays, that walk users through each step of the fusion process, and both processors have safety output circuit powered by double insulated transformers with galvanic isolation that maximizes safety on the jobsite.

### Processor Dimensions

Processor Model	Unit Voltage	A [in.]	B [in.]	C [in.]	D [in.]	E [in.]	Weight [lbs.]	Item Code
I-60	120v	12.95	9.17	9.92	12.16	6.49	50 w/o case	600801
I-105	240v	12.95	9.17	9.92	12.16	6.49	52 w/o case	600800

*Note: The included Pelican Case adds an additional 10 lbs. to overall weight.*

### Processor Specifications

	IFuse I60	IFuse I105
Working Temperature Range	14° F to 113° F	
Maximum Working Range	16" DIPS	63" IPS
Fusible Materials	PE / PEX / PP / PP-R	
Input Voltage	120 V AC (102 V – 138 V)	230 V AC (185 V – 260 V)
Input Current	32 A	16 A
Input Frequency	50 Hz (40-70 Hz)	
Output Voltage	8 V AC to 48 V AC	
Output Current	100% = 50 A, 60% = 70 A, 30% = 90 A	65 A > 20,000 sec, 105 A max 1,400 sec @ 68° F
Output Peak	100 A (Electronically Limited)	120 A (Electronically Limited)
Power Requirements (minimum)	5,000 Continuous Watt (non-welding) Generator with dedicated 30A 3-Prong Twist Lock Outlet	6,500 Continuous Watt (non-welding) Generator With dedicated 30A 4-Prong Twist Lock Outlet
Input Cable	13 ft NEMA L5-30 125V/30A Twist Lock	13 ft NEMA L14-30 250V/30A Twist Lock
Output Cable & Lead Terminals	10 ft. - 4.0 mm tips and 4.7mm adapters	
Display	Graphic, 128x64 Characters (alphanumeric), background lighting	
Language Options	English, Spanish, Italian, German, French, Russian	
No. of Reports Stored	7,500 Fusions	
Interface	USB / RS232	
Data Format	USB Format: CSV - TXT	
On-Board GPS	Optional with an additional cost and available if requested	



The removal of the oxidation layer and surface contamination from the fusion zone on the pipe is by far the most important and most critical aspect of the electrofusion process. Failure to adequately remove this material on the pipe surface and expose virgin material in the fusion zone is overwhelmingly the #1 cause of unsuccessful electrofusion joints. Proper pipe preparation requires the complete removal of a **minimum of “.007”** (seven one-thousands) of an inch of material from the surface of the pipe in the area that is to be fused. That is roughly the thickness of 2 sheets of paper. This outer layer or “skin” must be removed by peeling it away from the surface of the pipe in order to expose non-contaminated virgin resin. This is accomplished by using tools that have been tested and are acceptable for use. Integrity Fusion Products offer two types of mechanical pipe peelers; **Pipe End Peelers** that are inserted directly into the open end of the pipe, and **Interlocking Link Peelers** that roll over the outside surface of the pipe.

## Orbital Peeler

(peels all around the circumference of the pipe)



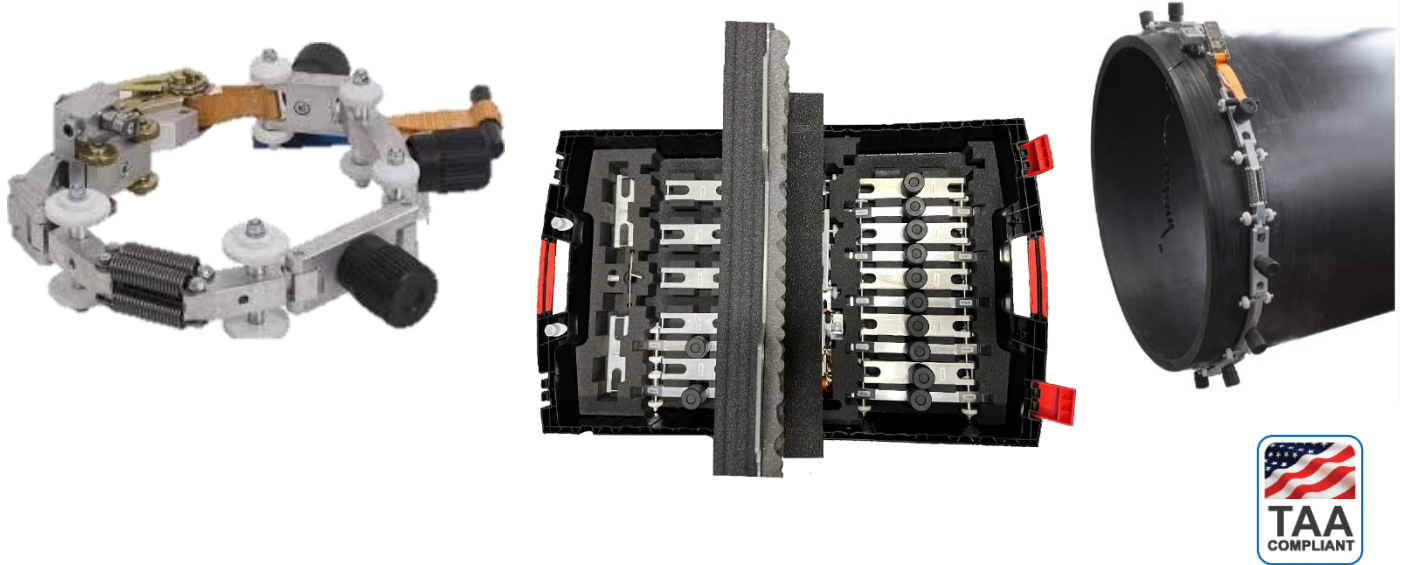
Orbital Peeler Model	Size Range	Item Code
INT-125	¾" IPS – 4" IPS	600633
INT-200	2 ½" IPS – 6" DIPS	600634

## Rotary Peeler

(peels around the end of the pipe only)

Rotary Peeler Specifications	3" - 6" Peeler	8" - 16" Peeler
	Item Code 600618	Item Code 600619
Suitable for pipes made of	PE, PE-HD, PE-X, PP	
For pipe dimensions (in)	3" - 6"	8" • 16"
Scraping depth (in)	0.25 to 0.35	
Length of peeling at max. insertion depth (in)	Approx. 5"	Approx. 6.7"
Product dimensions L x W x H (in)	16.73" x 14.6" x 5.5"	20.86" x 4" x 6"
Product weight (lbs.)	6lbs. 2.8 oz	15lbs. 14 oz.
Packaging dimensions L x W x H (in)	17.7 "x10.4"x18.5"	23.6" X 16.5" X 6"
Packaging material	Plastic	Plastic
Packaging type	Suitcase	Suitcase
Packaging weight (lbs.)	3 lbs. 49oz	5 lbs. .11.7 oz
Transport weight (lbs.)	9 lbs. 7.7 oz.	21 lbs. 9.8 oz





## Inter-Locking Link Peeler

Link Peeler Specifications	10" IPS - 30" IPS Peeler	30" DIPS – 48 IPS" Peeler
	Item Code - 600654	Item Code 600655
Suitable for pipes made of	PE, PE-HD, PE-X, PP	
For pipe dimensions (in)	10" IPS -30" IPS (24" DIPS)	8" • 16"
Scraping depth (in)	0.25 to 0.35	
Product dimensions L x W x H (in)	Depending on pipe dimension x 4" x 3.5" in.	Depending on pipe dimension x 4" x 3.4"
Product weight (lbs.)	13lbs. 7.2oz. (6.1 kg)	20 lbs. 15,1 oz
Packaging dimensions L x W x H (in)	25" x 19" x 6" (570 x 480 x 145)	22.8"x10.4"x18.5"
Packaging material	Plastic	
Packaging type	Suitcase	Toolbox
Packaging weight (lbs.)	7 lbs. 13.5.5oz (3.5 kg)	11 lbs. (5 kg)
Transport weight (lbs.)	21 lbs. 2.6oz. (9.6 kg)	31 lbs. 15,5 oz. (14.5 kg)



Engineered to accommodate pipe sizes ranging from 16" to 54", this robust hydraulic re-rounding clamp is a versatile solution. The hydraulic mechanism integrated into this external re-rounding clamp proves particularly helpful by eliminating the need for cumbersome hydraulic lines and external hydraulic pumps. While there are multiple techniques available for the professional fusion tech to use, the most reliable and effective way to conduct this task is by using re-rounding clamps that can apply equal pressure to the pipe surface all around the entire circumference of the pipe. Hydraulic Re-Rounding clamps have the mechanical strength to re-round large diameter HDPE pipe even with pipes with thicker SDR walls, and at the same time grip the pipe surface strong enough to be able for use to help aid pulling large diameter electrofusion couplers into place. **Integrity Fusion Products** offer a line of hydraulic re-rounding clamps that are simple, quick, and user-friendly, offering professional fusion technicians an intuitive and efficient solution for their re-rounding clamp needs. Made right here in the USA, these re-rounding clamps are constructed of quality steel that allows for rugged use and abuse in the field for job after job, and yet, accuracy is never in question due to its expert craftsmanship.



## FEATURES AND BENEFITS

• Available in sizes 24" IPS thru 54" IPS	• Simple, quick and easy to use
• Constructed of quality steel for rugged specifications	• Clamp closes with minimal effort
• Hydraulic jack pulls down tight with rapid release	• Each clamp fits a specific pipe diameter
• 1 year warranty	• Made in USA

## Hydraulic Style Re-Rounding Clamp

Size	Weight	Part #
24" IPS	145 lbs.	600901/INT-RR24-IH
26" IPS	157 lbs.	600902/INT-RR26-IH
28" IPS	166 lbs.	600903/INT-RR28-IH
30" IPS	178 lbs.	600904/INT-RR30-IH
32" IPS/30 DIPS	184 lbs.	600905/INT-RR32-IH
36" IPS	195 lbs.	600906/INT-RR36-IH
42" IPS	222 lbs.	600907/INT-RR42-IH
48" IPS	314 lbs.	600908/INT-RR48-IH
54" IPS	346 lbs.	600909/INT-RR54-IH

# INTEGRITY FUSION ACADEMY

ELECTROFUSION INSTALLATION TRAINING

## Integrity Fusion Academy

Professionally trained by an authorized manufacturers electrofusion trainer and to install electrofusion fittings following the manufacturers qualified procedures, is key to successful electrofusion joint assembly and fusion. As an electrofusion manufacturer, **Integrity Fusion Products** understands the importance of providing impactful factory electrofusion training to the market segments we serve. Along with proper installation procedures, the electrofusion courses **Integrity Fusion Academy** offers include a number of other pertinent sessions that provide professional Fusion Technicians with a much broader understanding of those things that can have an impact on an electrofusion joint assembly; such the characteristics of polyethylene, what are the essential tools required for a successful installation, a detailed look at the IFuse processors and their necessary power requirements. Our goal in the design of our electrofusion courses was not only to provide a thorough and comprehensive training experience but to keep the user engaged as well. Whether in-house at our Peachtree City location, on on-site at a Distributors facility, or in-field with a Distributor sponsored contractor.

### We Train the Professionals!



**Integrity Fusion Products strongly requires** that all individuals installing electrofusion fittings in permanent field applications should be done only by individuals who have a strong working knowledge of polyethylene and heat fusion methods, that have been properly trained, qualified, and hold a current training certificate issued from a recognized electrofusion fitting manufacturers authorized instructor, and that have demonstrated their understanding of these requirements by correctly preparing electrofusion test assemblies that have been qualified by recognized ASTM destructive testing. Other stipulations and regulations may apply, depending on fitting size, application, local codes, and/or jurisdictional oversight of other state and local regulating agencies.

The Integrity Fusion Products Electrofusion Qualification program requires:

- Attendance of personal classroom instruction (*in-person or on-line*),
- Successful completion of required certification tests (*hard-copy or on-line*),
- Completion of a witnessed demonstration of instructed electrofusion procedures while making required electrofusion joint assemblies (*in-person or documented in our approved on-line test site*),
- Test assemblies successfully pass the required ASTM destructive testing requirements.

**NOTE:** *Factory Authorized electrofusion training and qualification is available to all qualified Distributor Fusion Techs. Contractors and Municipalities can be Factory Trained and Qualified but must be recommended, vetted, and sponsored by one of Integrity Fusion's distributors.*

***All Contractor & Municipality training will be coordinated and scheduled through the sponsoring Distributor.***

Integrity Fusion Products has 3 levels of Factory Authorized Electrofusion Training and Qualification.

- **Level 1 (L1) training and qualification for fittings 12" and smaller**
- **Level 1 + (L1 plus) training and qualification for fittings 24" and smaller**
- **Level 2 (L2) training and qualification for fitting 14" and larger.**

### **Level 1 (L1) Training Program for installation of fittings 12" and smaller**

The Integrity Fusion Products L1 training program is designed to educate and train Distributor EF Technicians and Distributor sponsored Contractor/Municipality Installers that are needing factory authorized qualification & training in electrofusion installation procedures for applications 12" and smaller.

The L1 Training and Qualification program is focused on providing the individual with foundational information that teaches a strong understanding of the "what", "why", and "how" of electrofusion as well specific requirements and considerations for installing electrofusion couplers, branch saddles and flex restraints. This course is open to individuals new to electrofusion installation as well as those requiring "L1 Small Diameter" electrofusion requalification.

### **L1 + (Plus) Training Program for installation of fittings 24" and smaller**

Integrity Fusion Products Level 1 + (plus) training program is geared for the experienced and qualified Distributor EF Technicians and distributor sponsored contractors needing factory authorized training and qualification in electrofusion installation procedures for applications in applications 24" and smaller.

The L1+ training program provides the individual with a refresher of the L1 fundamentals pertaining to the "what", "why", and "how" of the basic electrofusion principles and then builds on that understanding while addressing specific issues and challenges associated with larger diameter installations. The L1+ training course is open to the following individuals:

- **Experienced installers that currently hold a valid L1 EF small diameter electrofusion certificate from Integrity Fusion Products or another recognized electrofusion manufacturer, but do not yet have experience in large diameter electrofusion installations.**
- **Have a verifiable work history of successfully installing small diameter electrofusion fittings with or for a recognized electrofusion distributor or contractor and have a minimum level of installation experience with larger EF fittings 24" and smaller.**

### ***Integrity Fusion Products Company Policy for Sales and Installation of EF Couplers Larger Than 24":***

Integrity Fusion Products will only allow the sale of electrofusion couplers larger than 24" to Distributors that have a current fusion tech on staff that will be on site to install or oversee a contractor recognized by Integrity Fusion Products for the installation of couplers larger than 24". This Distributor Fusion Tech must hold a current L2 Large Diameter training certificate from Integrity Fusion Academy.

## Level 2 (L2) Training Program for installation of fittings 14" and larger

The Integrity Fusion Products L2 training program is geared to the more highly experienced Distributor EF Technicians and distributor sponsored contractors needing factory authorized training and qualification in electrofusion installation procedures for applications 14" and larger.

The L2 training program provides the individual with a refresher of the L1 fundamentals pertaining to the "what", "why", and "how" of the basic electrofusion principles and then builds on that understanding while addressing specific issues and challenges associated with large diameter installations. The L2 training course is open to individuals that:

- **Hold a current L1 qualification certificate** from Integrity Fusion products or another recognized electrofusion manufacturer and have extensive experience in small diameter installation, **or**
- **Hold a current Level 2** installation qualification certificate from another recognized electrofusion manufacturer, **or**
- **Have a verifiable work history** of successfully installing large diameter electrofusion fittings, **or**
- **Hold a current L2 qualification certificate** but need requalification.

**Integrity Fusion Products L1, L1+, & L2 Electrofusion Qualification Certificates are valid for 2 years after date of issuance.**

*(An on-line 1-year re-certification program is available, but **only** to experienced Electrofusion Techs meeting the L2 Course requirements, and that have a **verifiable** large diameter installation work history. Approval for the On-Line Re-certification program must be discussed on an individual basis. The on-line program **IS NOT** open to new or inexperienced Electrofusion Techs.)*

**Integrity Fusion Products Factory Certified Electrofusion Training is available,**

- **On-Line training available on request (currently for Level 1 certification or qualified and vetted L2 Fusion Tech Recertification only)**
- **Factory In-House training is available on regularly scheduled dates. Trainees are responsible for travel and hotel accommodation and expenses.**
- **Distributor On-Site training is available but is subject to trainer availability. Scheduling must be coordinated through their Regional Outside Sales Representative. (In addition to the course fee, an additional cost will be added to cover the travel costs incurred by the trainer to the Distributors training site other classroom and training equipment requirements may apply.)**

## What to Expect When Taking the On-Line Courses

Integrity Fusion Academy on-line training utilizes a combination of tools designed and organized to engage, educate, reinforce, equip, and test each participant in each training session along the way.

Our training tools include self-guided presentations, high quality videos, and reinforcing quizzes, and in the L1 small diameter electrofusion training course, it also includes a mandatory homework session that requires each participant to properly prepare, assemble, photographically document each step of their EF Coupler and EF Branch Saddle joint assembly and fusion which must then be uploaded and submitted onto the training site to complete their homework requirements

Individuals should plan on spending an average of **6 to 8 hours** to complete the on-line course and homework requirements, keeping in mind that these courses are self-paced, and the students can log into or out of their training account as needed without losing their place or having to start over by simply using the password provided to them.

**NOTE: A test kit consisting of (2) 2" pipe sections, (1) 2" EF Coupler, and (1) 2" x 2" EF Branch Saddle will be provided and must be used to complete the on-line requirements for L1 qualification, unless other arrangements have been previously made and approved by Integrity Fusion Academy. Once the test kit has been assembled it must be sent back Integrity Fusion Products for ASTM Destructive Testing.**

**Integrity Fusion Products  
ATTN: Training Room/Rick Ponder  
270 Parkade Court  
Peachtree City, GA 30269**

## Topics and Discussions Covered in Our Electrofusion Courses

- **The Electrofusion Installers Responsibility**

A brief examination of where the EF Installer fits in the chain of responsibility, and why that is important.

- **Polyethylene 101**

A simple examination of “what polyethylene is”, “why it is that way”, “why it acts the way it does”, and “how that is beneficial to the job you are doing”.

- **Principles of Polyethylene Fusion**

A simple examination of the heat fusion process. The similarities and differences between convention fusion methods (butt, socket, saddle) and the electrofusion method.

- **Electrofusion Fitting Design**

A closer look at the anatomy of the electrofusion fitting design. Learn why design is important, the purpose of the design, how the design works, and what happens when it does not.

- **IntegriFuse Processor 101 – Specs and Features**

A close look at the similarities and differences between the IntegriFuse I60 and the IntegriFuse I105 Electrofusion Processors

- **IntegriFuse Processor 210 – Modes and Operation**

A step-by-step run through of each of the IntegriFuse Processors operation modes. Bar Code Mode, Manual Bar Code Mode, Manual Time & Voltage Mode.

- **Electrofusion Processor Power Requirements**

A close look into the specific power supply requirements needed for fusing electrofusion fittings. What to look for and what to look out for.

- **The Electrofusion Installers Toolbox**

A close look at the required tools needed to perform a successful electrofusion joint assembly. This includes identifying specific tools needed, specific tool purposes, proper use of each required tool, expected results of using the tools correctly, and the consequences of not using the tools or assembling the electrofusion joints correctly.

- **Level 1 EF Coupler Installation**

Specific step-by-step procedures and considerations for successfully installing small diameter electrofusion couplers.

- **Level 1 EF Branch Saddle Installation**

Specific step-by-step procedures and considerations for successfully installing small diameter electrofusion branch saddles.

- **Level 1 EF Flex Restraint Installation**

Specific step-by-step procedures and considerations for successfully installing electrofusion flex restraints.

- **Level 2 EF Coupler Installation**

Specific step-by-step procedures and considerations for successfully installing large diameter electrofusion couplers.

- **Level 2 EF Branch Saddle Installation**

Specific step-by-step procedures and considerations for successfully installing large diameter electrofusion branch saddles.

**\*\*Most sessions are made up of a video, a reinforcing presentation, and a Quiz. The final completion of the on-line course requires the successful submission of specific homework assignments.**

## Electrofusion Installation Technician Questionnaire

For Integrity Fusion Academy to better serve an individual's training need, it would help for us to know a little more about your electrofusion background, understanding and installation experience. Please fill out and submit a copy of this questionnaire for each individual requesting training, qualification and/or requalification.

Company, Contractor,  
or Municipality Name

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Sponsoring Distributor  
(If applicable)

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### Installation Tech Information

First Name:

---

Last Name:

---

Email Address:

---

Phone:

---

### Current Electrofusion Experience Level

New Tech

L1  
(12" & Smaller)

L2  
(14" & Larger)

Current EF Certificate #:

---

Certificate Issued By:

---

Issue Date:

---

Expiration Date:

---

### Years of Electrofusion Experience (check one)

0 – 1 Year

2 – 4 Years

5 – 10 Years

11+ Years

Size Range Currently Qualified to Install:

---

Largest Diameter EF Coupler Installed:

---

Number of Large Diameter Couplers Over 24" Installed:

---

Signed By:

---

Date:

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# **INTEGRITY** Fusion Products, Inc.

## **Polyethylene Industry Related Resources** Standards - Tech Notes – Guidelines -Procedures



**PLASTICS  
PIPE  
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THE VOICE OF AN INDUSTRY

**MEMBER COMPANY**





**American Water Works Association**AWWA [www.awwa.org](http://www.awwa.org)

1. **ANSI/AWWA C901** Polyethylene (PE) Pressure Pipe and Tubing, ¾ In. (19 mm) Through 3 In. (76 mm) for Water Service
2. **ANSI/AWWA C906** Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks
3. **AWWA M55** PE Pipe—Design and Installation

**Plastics Pipe Institute**PPI [www.plasticpipe.org](http://www.plasticpipe.org)

1. PPI Handbook of Polyethylene Pipe
2. PPI Polyethylene Piping Systems Field Manual for Municipal Water
3. PPI Position Paper on HDPE (PE4710) Distribution Potable Water Pipe Sizes and Pressure Classes
4. **PPI TR-4** PPI Listing of Hydrostatic Design Basis
5. (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings For Thermoplastic Piping Materials or Pipe
6. **PPI TR-41** Generic Saddle Fusion Joining Procedure for Polyethylene Gas Piping
7. **PPI TN-13** General Guidelines for Butt, Saddle and Socket Fusion of Unlike Pipes and Fittings
8. **PPI TN-38** Bolt Torque For Polyethylene Flanged Joints
9. **PPI TN-46** Guidance for Field Hydrostatic Testing of High-Density Polyethylene Pressure Pipelines: Owner's Consideration, Planning, Procedures, and Checklists

**Municipal Advisory Board**MAB [www.plasticpipe.org/municipal\\_pipe/advisory/](http://www.plasticpipe.org/municipal_pipe/advisory/)

1. **MAB-1**, MAB Generic Electrofusion Procedure for Field Joining of 12 Inch and Smaller Polyethylene (PE) Pipe
2. **MAB-2**, MAB Generic Electrofusion Procedure for Field Joining of 14 Inch to 30 Inch Polyethylene (PE) Pipe
3. **MAB-3**, MAB Model Specifications for PE 4710 Buried Potable Water Service, Distribution and Transmission Pipes and Fittings
4. **MAB-4**, MAB Basic HDPE Repair Options
5. **MAB-5**, MAB Guidelines for PE4710 Pipe Bursting of Potable Water Mains.
6. **MAB-6**, MAB Guidelines for HDPE Pipeline Inspection

**NSF International**[www.nsf.org](http://www.nsf.org)

1. **NSF/ANSI 61** Drinking Water System Components—Health Effects

**ASTM International**[www.astm.org](http://www.astm.org)

1. **ASTM D2321** Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
2. **ASTM D2683** Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
3. **ASTM D2774** Standard Practice for Underground Installation of Thermoplastic Pressure Piping
4. **ASTM D3261** Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
5. **ASTM D3350** Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
6. **ASTM F905** Standard Practice for Qualification of Polyethylene Saddle-Fused Joints
7. **ASTM F1041** Standard Guide for Squeeze-off of Polyolefin Gas Pressure Pipe and Tubing
8. **ASTM F1055** Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
9. **ASTM F1290** Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
10. **ASTM F1563** Standard Specification for Tools to Squeeze-off Polyethylene (PE) Gas Pipe or Tubing
11. **ASTM F1668** Standard Guide for Construction Procedures for Buried Plastic Pipe
12. **ASTM F2164** Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
13. **ASTM F2206** Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
14. **ASTM F2620** Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
15. **ASTM F2786**, Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Gaseous Testing Media Under Pressure (Pneumatic Leak Testing)
16. **ASTM F2880** Standard Specification for Lap-Joint Type Flange Adapters for Polyethylene Pressure Pipe in Nominal Pipe Sizes ¾ in. to 65 in.
17. **ASTM F3124** Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints in Plastic Piping Systems or Fittings
18. **ASTM F3183** Standard Practice for Guided Side Bend Evaluation of Polyethylene Pipe Butt Fusion Joint
19. **ASTM F3190** Standard Practice for Heat Fusion Equipment (HFE) Operator Qualification on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings