

SHIELDTM

Trusted Worldwide



SHIELD POLYETHYLENE PIPING SYSTEM

INNOVATION IN POLYETHYLENE PIPING SYSTEM
FOR WATER, GAS & FIRE APPLICATIONS

FIRE

GAS

WATER



"Shield...uninterrupted flow"

PIPE SIZES & CORRESPONDING WALL THICKNESS AT DIFFERENT SDRS AS PER ISO 4427

SDR	SDR41		SDR33		SDR26		SDR21		SDR17		SDR13.6		SDR11		SDR9		SDR7.4		SDR6		
	PN 3.2	PN4	PN 4	PN 5	PN 5	PN 6	PN 6	PN 8	PN 8	PN 10	PN 10	PN 10	PN 12.5	PN 12.5	PN 16	PN 16	PN 20	PN 20	PN 25	PN 25	
Nominal Size	wall thickness																				
	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	e-min	e-max	
16																					
20																					
25																					
32																					
40																					
50																					
63																					
75																					
90																					
110																					
125																					
140																					
160																					
180																					
200																					
225																					
250																					
280																					
315																					
355																					
400																					
450																					
500																					
560																					
630																					

Dimension in millimeters

a) PN values are based on C=1.25
 b) Tolerances in accordance with grade V of ISO 11922-1:1997
 c) The calculated value of e_{min} (ISO 4085:1998) is rounded up to the nearest value of either 2.0, 2.3 or 3.0. This is to satisfy certain national requirements.
 For practical reasons a wall thickness of 3.00 mm is recommended for electrofusion jointing and lining applications.

SHIELD HDPE PIPING SYSTEM FOR FIRE LINE

Shield HDPE pipes are manufactured to ISO4427 (metric) and ANSI/AWWA C906 (inch) standards. Shield supply molded fittings and also produce segmented fittings as per ISO and AWWA standards under stringent quality control. Our pipes and fittings are tested at each stage of production to comply with quality and standards.

PIPES DIMENSIONS IN ISO 4427:

Nominal outside diameter	SDR11		SDR9		SDR7.4	
	PN 16		PN 20		PN 25	
	e-min	e-max	e-min	e-max	e-min	e-max
50	4.6	5.2	5.6	6.3	6.9	7.7
63	5.8	6.5	7.1	8	8.6	9.6
75	6.8	7.6	8.4	9.4	10.3	11.5
90	8.2	9.2	10.1	11.3	12.3	13.7
110	10	11.1	12.3	13.7	15.1	16.8
125	11.4	12.7	14	15.6	17.1	19
140	12.7	14.1	15.7	17.4	19.2	21.3
160	14.6	16.2	17.9	19.8	21.9	24.2
180	16.4	18.2	20.1	22.3	24.6	27.2
200	18.2	20.2	22.4	24.8	27.4	30.3
225	20.5	22.7	25.2	27.9	30.8	34
250	22.7	25.1	27.9	30.8	34.2	37.8
280	25.4	28.1	31.3	34.6	38.3	42.3
315	28.6	31.6	35.2	38.9	43.1	47.6
355	32.2	35.6	39.7	43.8	48.5	53.5
400	36.3	40.1	44.7	49.3	54.7	60.3
450	40.9	45.1	50.3	55.5	61.5	67.8
500	45.4	50.1	55.8	61.5		
560	50.8	56				
630	57.2	63.1				

Dimension in millimeters

PIPE DIMENSIONS IN ANSI/AWWA C906:

Nominal IPS, Size In Inches	O D in inches	Pressure Class			
		Class 150		Class 200	
		Min Wall thickness (inch)	Average ID (inches)	Min Wall thickness (inch)	Average ID (inches)
4	4.500	0.409	3.633	0.500	3.440
6	6.625	0.602	5.349	0.736	5.065
8	8.625	0.784	6.963	0.958	6.594
10	10.750	0.977	8.679	1.194	8.219
12	12.750	1.159	10.293	1.417	9.746
14	14.000	1.273	11.301	1.556	10.701
16	16.000	1.455	12.915	1.778	12.231
18	18.000	1.636	14.532	2.000	13.760
20	20.000	1.818	16.146	2.222	15.289
22	22.000	2.000	17.760	2.444	16.819
24	24.000	2.182	19.374	2.667	18.346

Dimension in inches

Note: For installation instructions please refer to our technical guidelines. Refer to FM certificate for details.



UNDERGROUND HDPE FIRE LINE CONNECTED TO ABOVE GROUND STEEL PIPE



HYDRANT INSTALLATION

Where local soil does not provide the needed support for the HDPE pipe, heavy thrust blocks or dense concrete mixes can sink. When a large thrust block sinks, it creates excessive bending moment and failure that we are trying to avoid. Where good local soil conditions exist, no thrust block or special bedding is required. Where local soil conditions do not provide needed soil conditions, the use of geotextile fabrics or stabilized soils offer another way to provide good proper support to pipe and fittings to prevent excessive bending.



PIPE FITTINGS

Shield HDPE system offers electrofusion fittings which are easy to use and offer high performance along with a rapid, convenient method of joining with Shield polyethylene pipes. Their design ensures optimum melt pressure as the energizing coil of wire is precisely positioned to ensure uniform melting.

Each fitting displays a bar code label that enables the automatic Electro fusion control units (ECUs) to scan the barcode and determine the fusion parameters. Fittings are offered in PE100 Black & PE80 Yellow, size up to 400mm, (with larger couplers upto 710mm progressively available from the production line.)

The Long Spigot range and segmented range offers a comprehensive choice of fittings suitable for Buttfusion. Products are offered in PE100 Black & PE80 Yellow.






















Shield also offers custom made segmented fittings to complete its fittings range. Its fittings are fully pressure rated full bore depending up on the configuration required. Each fittings design is thoroughly analyzed prior to construction to suit to the pressure rating of the system in to any areas in to which it is designed to be.























Note: Refer to FM certificate for details.



HDPE FITTINGS RANGE

	SL NO.	DESCRIPTION	RANGE SDR11	RANGE SDR17	AVAILABLE
ELECTROFUSION FITTINGS					
	1	39.5V Couplers	20mm - 315mm	355mm-400mm	PE100 Black / Blue PE80 Yellow
	2	39.5V Reducers	20mm - 180mm		PE100 Black / Blue PE80 Yellow
	3	39.5V 32mm Top loading Tapping Tee	63mm - 315mm		PE100 Black / Blue PE80 Yellow
	4	39.5V PE80 63mm Top Loading Tapping Tees	90mm - 315mm		PE100 Black / Blue PE80 Yellow
	5	39.5V 25mm Low Volume Under Clamping Tapping Tees	40mm - 160mm		PE100 Black PE80 Black
	6	39.5V 32mm Low Volume Under Clamping Tapping Tees	40mm - 160mm		PE100 Black PE80 Black
	7	39.5V 32mm Medium Volume Under Clamping Tapping Tees	63mm - 225mm		PE100 Black only
	8	39.5V 40mm Medium Volume Under Clamping Tapping Tees	63mm - 180mm		PE100 Black only
	9	39.5V PE80 63mm Top Loading Branching Saddle	63mm - 110mm		PE80 Black only
	10	39.5V 20/32/40/50/63mm Top Loading Branching Saddle	40mm - 200mm		PE100 Black PE80 Black
	11	39.5V PE80 Purge Saddle	63/90/125/180mm		PE80 Yellow only
	12	39.5V PE80 High velocity Purge Saddle	180/250/315mm		PE80 Yellow only
	13	39.5V PE80 Bagging Saddle	180/250/315mm		PE80 Yellow only
	14	39.5V 90Deg Elbows	20mm - 180mm		PE100 Black / Blue PE80 Yellow
	15	39.5V 45Deg Elbows	25mm - 180mm		PE100 Black / Blue PE80 Yellow
	16	39.5V Tees	20mm - 180mm		PE100 Black / Blue PE80 Yellow
	17	39.5V Flanged Tees			PE100 Black / Blue PE80 Yellow
	18	Duck foot bend	63/90/125/180mm-80, 90/110/125/180mm-100		PE100 Black / PE100 Blue
	19	Electrofusion Wipes	Iso-Propyl Alcohol Wipes		100% Alcohol, 100per tube
	20	39.5V Transition Couplers, PE / Brass, Female BSP Taper	25/32/40/50/63mm		PE100 Black
	21	39.5V Transition Couplers, PE / Brass, Male BSP Taper	25/32/40/50/63mm		PE100 Black
	22	39.5V 90 Deg Transition Elbow , PE / Brass, Female BSP Taper	25/32/40/50/63mm		PE100 Black
	23	39.5V 90 Deg Transition Elbow , PE / Brass, Male BSP Taper	25/32/40/50/63mm		PE100 Black
	24	39.5V 45 Deg Transition Elbow , PE / Brass, Female BSP Taper	25/32/40/50/63mm		PE100 Black
	25	39.5V 45 Deg Transition Elbow , PE / Brass, Male BSP Taper	25/32/40/50/63mm		PE100 Black

HDPE FITTINGS RANGE

LONG SPIGOT BUTTFUSION FITTINGS					
	1	Reducers	20mm - 400mm	32mm-315mm	PE100 Black / Blue PE80 Yellow
	2	90Deg Elbows	20mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	3	45Deg Elbows	25mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	4	Tees	20mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	5	Stub Flanges	32mm - 400mm	75mm-400mm	PE100 Black / Blue PE80 Yellow
	6	Reduced Branch Tees	63mm - 315mm	63mm-315mm	PE100 Black / Blue PE80 Yellow
	7	Flanged Branch Tees	63mm - 315mm	63mm-315mm	PE100 Black/Blue
	8	All Flanged Tees	110/250/315mm		PE100 Black/Blue
	9	End Cap	20mm - 400mm	75mm-400mm	PE100 Black PE80 Yellow
PUPPED (EXTENDED) BUTTFUSION FITTINGS					
	1	Pupped Reducers	63mm - 315mm	63mm-315mm	PE100 Black / Blue PE80 Yellow
	2	Pupped 90 Deg Elbow	63mm - 355mm	90mm-355mm	PE100 Black / Blue PE80 Yellow
	3	Pupped 45 Deg Elbow	63mm - 355mm	90mm-355mm	PE100 Black / Blue PE80 Yellow
	4	Pupped Equal Tee	63mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	5	Pupped Equal Tee, Large Diameter		450/500/630mm	PE100 Black / Blue PE80 Yellow
	6	Pupped Reduced Branch Tees, Large Diameter			PE100 Black / Blue PE80 Yellow
	7	Pupped Reduced Branch Tees	110mm - 355mm	110mm-355mm	PE100 Black / Blue PE80 Yellow
	8	Pupped Stub Flange Assembly, Backing ring drilled to BS4504 PN16	63mm - 630mm	90mm-630mm	PE100 Black / Blue PE80 Yellow
	9	Pupped Flanged Short Branch Tees	63mm - 355mm	63mm-355mm	PE100 Black / Blue PE80 Yellow
	10	90 Deg Formed Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	11	45 Deg Formed Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	12	221/2 Deg Formed Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	13	11 1/4 Deg Formed Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	14	90 Deg Segmented Elbow	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	15	45 Deg Segmented Elbow	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	16	221/2 Deg Segmented Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow
	17	11 1/4 Deg Segmented Bend	90mm - 400mm	90mm-400mm	PE100 Black / Blue PE80 Yellow

POLYETHYLENE RANGE IS DESIGNED TO COMPLY WITH THE REQUIREMENTS OF ONE OR MORE OF THE STANDARDS:

GENERAL STANDARDS

ISO 161-1:1996	Thermoplastic Pipes – Nominal Outside diameters & Nominal pressures metric series.
ISO 4065:1996	Thermoplastic Pipes – Universal Wall Thickness tables.
BS ISO11922-1:1999	Thermoplastic pipes for the conveyance of fluids dimensions and tolerances metric series.
BS 6437:1984	Polyethylene Pipes (type50) in metric diameters for general purposes.
BS EN 1092-1:2007	Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated steel flanges.

RELEVANT STANDARDS IN THE PE PIPE MODEL FOR WATER & GAS

ISO 4427-1,2,3,5 (2007-08)	PE pipes and fittings for water supply- General, Pipes, Fittings, Fitness of system
ISO4437 (2007-06)	Buried polyethylene(PE) pipes for the supply of Gaseous fuels-Metric series
BS EN 15494:2003	Specifications for polyethylene components and systems
BS EN12201:2003	Plastic Piping for water supply- Polyethylene
BS EN 805:2000	Water supply – requirements for systems and components outside buildings
BS EN 681-2:2000	Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Thermoplastic elastomers.
BS 5306:1990-Part2	Fire extinguishing installations and equipment on premises
BS EN ISO8085:2001-1	Polyethylene fittings for use PE pipes for the supply of gaseous fuels
BS EN ISO8085:2001-2	Spigot fittings for buttfusion or socket fusion using heated tools and for use with electrofusion fittings
BS EN ISO8085:2001-3	Electrofusion fittings
BS EN1555:2002	Plastic piping systems for supply of gaseous fuels- polyethylene
BS EN682:2002	Elastomeric seals- Materials for seals used in pipes and fittings carrying gas and hydrocarbon fluids
DIN 8074:1999	Pipesof high density polyethylene(HDPE) type 2- dimensions
DIN 8075:1999	Pipesof high density polyethylene(HDPE) type 2- testing
DIN 16963:1980	Part-1 High density polyethylene (HDPE) fittings dimensions, type 2
DIN 3543-4:1984-08	High density polyethylene (HDPE) tapping valves for HDPE pipes
IGN 4-08-01:1994	Bedding & sidefill materials for buried pipelines
ISO 12176-1,2,3,4	Plastic pipes and fittings-Equipment for fusion jointing-Buttfusion, Electrofusion,Operators badge, Traceability coding
ISO 13477/78/79/80	Thermoplastic pipes for conveyance of fluids- Determination of resistance to rapid crack propagation- Small scale steady state test, Full scale test, Test method for slow crack growth on notched pipes(notch test), Resistance to slow crack Growth- Cone test method
WIS 4-08-02:1994	Specification for bedding and sidefill materials for buried pipelines
WIS 4-24-01:1998	Specification for mechanical fittings and joints including flanges for polyethylene pipes for the conveyance of cold potable water for the size range 90 to 1000 including those made of metal or plastics or a combination of both
WIS 4-32-08:2002	Specification for the fusion jointing of polyethylene pressure pipeline systems using PE80 &PE100 materials
WIS 4-32-14:1995	Specification for PE80&PE100 electro fusion fittings for nominal sizes up to and including 630
WIS 4-32-15:1995	Specification for PE80&PE100 spigot fittings for nominal sizes up to and including 1000
WIS 4-32-16:1998	Specification for Butt fusion jointing machines
WIS 4-32-17:2001	Polyethylene pressure pipes for pressurized water supply and sewerage duties

LIST OF ABBREVIATIONS

ANSI	American National Standard Institute	FPM	Fluoric Rubber	KRV	Plastic piping Association
ASTM	American Society for Testing & Materials	NBR	Nitrile Rubber	SDR	Standard Diamentional Ratio
BS	British Standard	G	Pipe Thread	WIS	Water Industry Specification
DIN	Deutsche IndustrieNormen	R	Taper Male Thread	S	Pipe Category
ISO	International Standard Organization	PTFE	Polytetrafluorethylene	IGN	Information & Guidance Note Water Industry
ABS	Acrylonitrile Butadien Styrene	Rp	Parallel Female Thread	FM	Fusion Method/ Factory Mutual
PVC-U	Polyvinyl Chloride	PB	Polybutylene	DN	Nominal Diameter
PVC-C	Polyvinyl Chloride Chlorinated	E	Wall Thickness	PN	Nominal Pressure
PP	Polypropylene, heat stabilized	PBTP	Polybutylene Terephthalate	Kg	Weight In Kilogram
PE	Polyethylene	*	Registered Trade Mark	g	Weigth In Gram
PVDF	Polyvinylidene Fluoride	St	Steel	SP	Standard Pack
EPDM	Ethylene Propylene Rubber	DVS	German Association of Welding	Mpa	Mega Pascal
GP	Gross Pack	d	Pipe Outside Diameter	Psi	Pounds per square inch



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