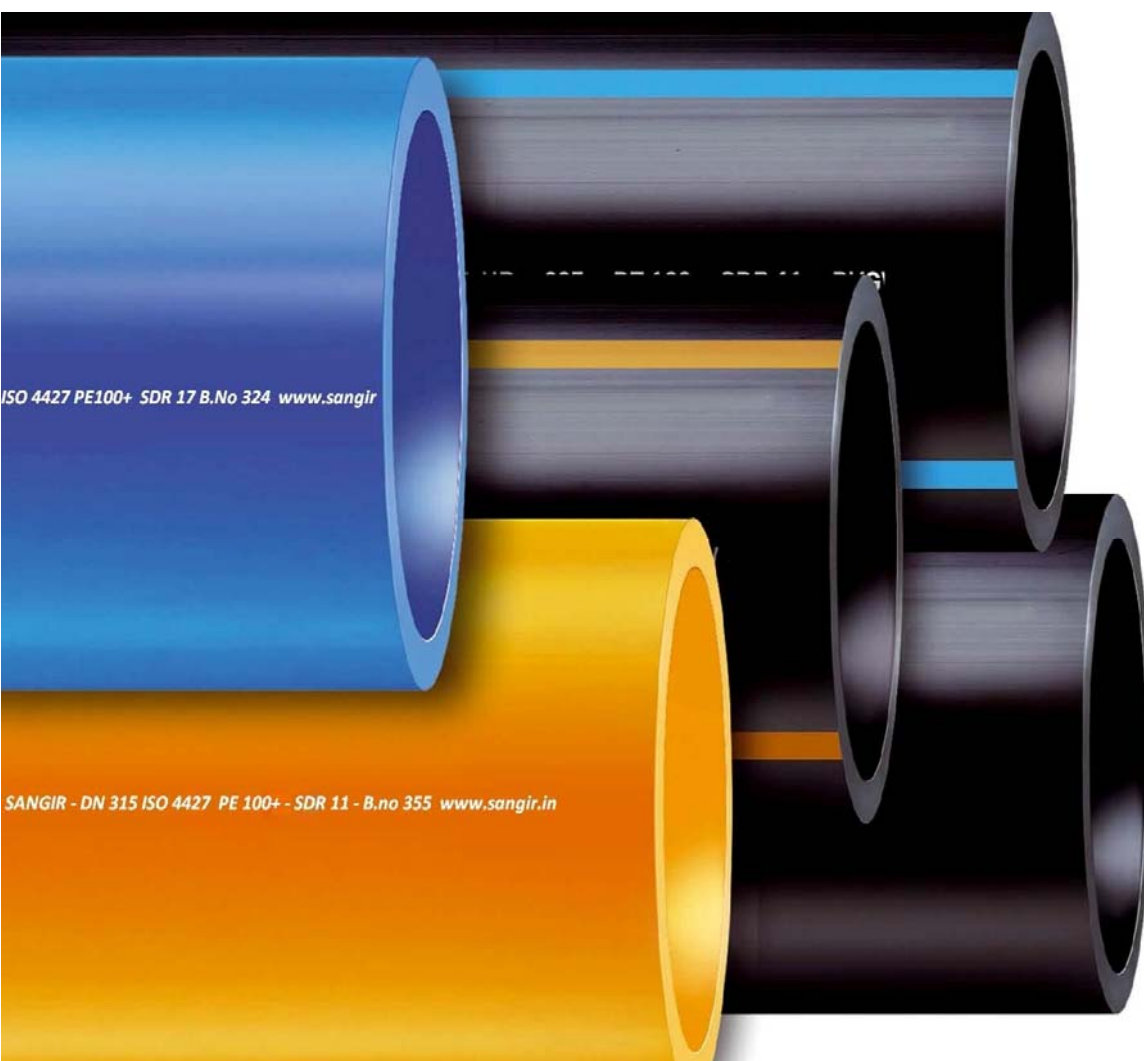




SANGIR PLASTICS P. LTD.

Performance • Persistence • Partnership.

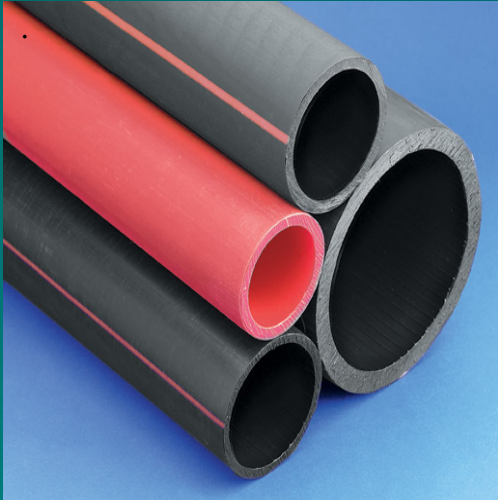
POLYETHYLENE PIPING SYSTEMS

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Website: www.sangir.in

✉ sangir@vsnl.com; info@sangir.in

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F: +91-22-28741794

YOUR PARTNER FOR SUCCESS.



MUTIPLE SOLUTIONS
UNDER ONE ROOF

SANGIR PLASTICS is a manufacturer of industrial piping systems and specialized plastic products, based in Mumbai, India. An ISO 9001:2000 & ISO 14001:2004 Certified Company, **Sangir** has been active in the plastics industry for over 25 years and occupies place in the industry as premium quality manufacturer of advanced plastics products.

Sangir has multiple manufacturing locations within India at Vapi, Gujarat & near Jaipur, Rajasthan spanning on a total area of over 500000 sq ft.

Primary products include:

Pipes and Fittings:

- Polyethylene (PE) per ISO 4427, DIN 8074.
- HDPE Pipes per IS 4984, IS14333, IS14151
- Polypropylene (PPH) per DIN 8077.
- PP Fire Retardant (PPFR).
- PP Glass Lined (PPGL).
- Kynar® PolyVinylidene Fluoride (PVDF).
- High Impact PolyStyrene (HIPS).

Sheets Solutions:

- Advanced Grade PE/PP sheets & blocks.

Specialized Solutions:

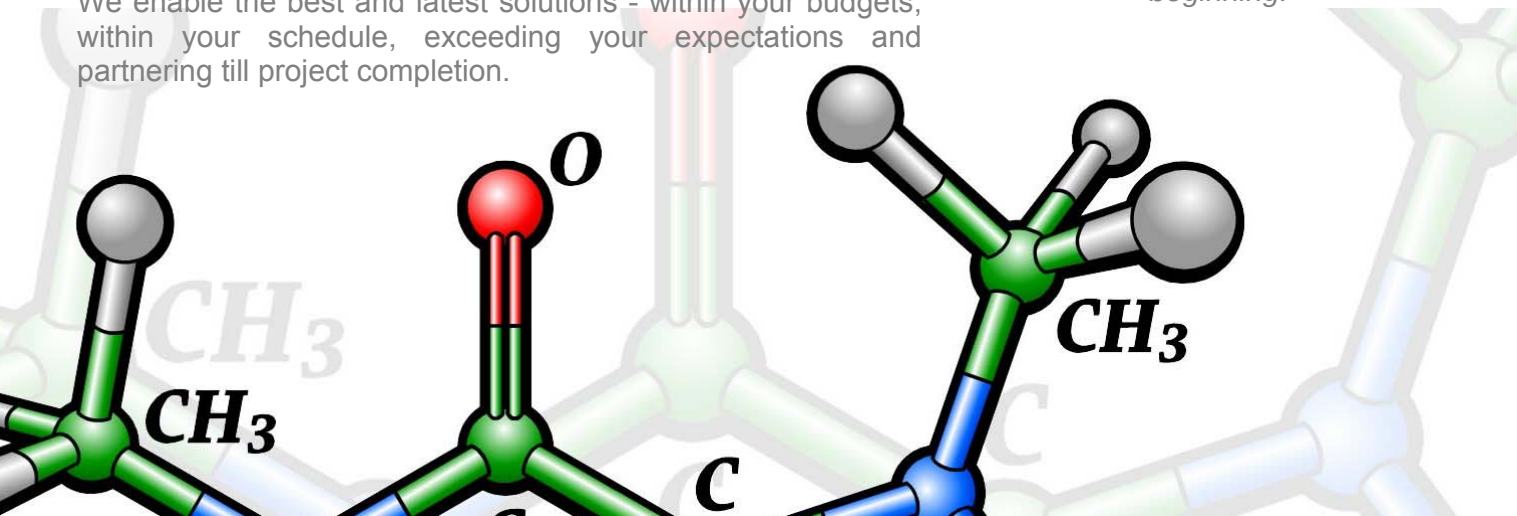
- Dredging Pipes, Floaters & Belts.
- Custom Fabricated PE/PP components.
- Cable Ducting.
- Offshore Marine Applications.

Products are exported to over 20 different countries in 4 continents. Products are widely used in diverse applications handling a range of fluids & gases at temperature between -40°C to 140°C .

Focus on **Understanding & Managing** Customer needs.

Advising Customers for the right and cost effective solutions. We enable the best and latest solutions - within your budgets, within your schedule, exceeding your expectations and partnering till project completion.

*- Quality is a race where
the finish is only the
beginning.*



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Quality Assurance



ISO 9001:2008



ISO 14001:2004

BUILT TO PERFORM
BUILT TO LAST.



PE -
PERFORMANCE
ENHANCED

Solutions for the all Major industries:

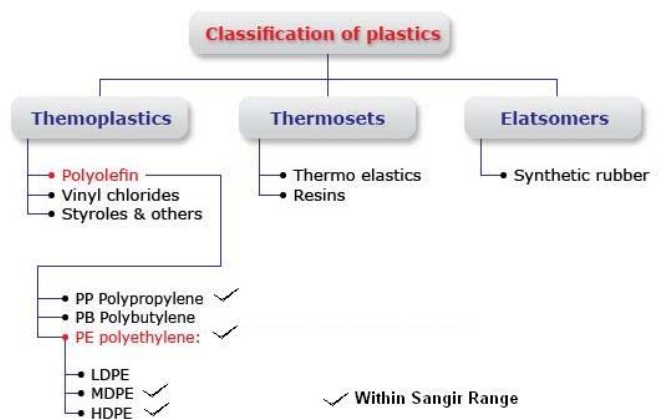
Sangir provides flexible solutions in Polyethylene (PE) for transportation of liquids, chemicals, slurries and gas to combat issues of corrosion, abrasion and overall life of the system. A broad range of sizes is available between 20mm to 630mm OD in pressure ratings 2.5 to 16 kg/cm². Our variety of fittings options, installations & commissioning services will attend to all your easy or complex piping needs.

POLYETHYLENE PIPING SYSTEMS

General Properties of Polyethylene:

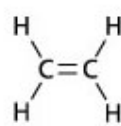
Polyethylene is the best known volume plastic a relatively high molecular form. **HDPE (High Density polyethylene)** is defined by a density of greater or equal to 0.941 g/cm³. HDPE has a low degree of branching and thus stronger intermolecular forces and tensile strength. Sangir makes pipes from HDPE and also form Medium Density PE (MDPE). General Classification of PE as a Plastics and its chemical composition is presented below.

Classification of PolyEthylene



Chemical Composition

The ethylene molecule is C₂H₄ (CH₂=CH₂)



Ethylene

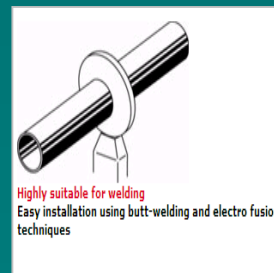
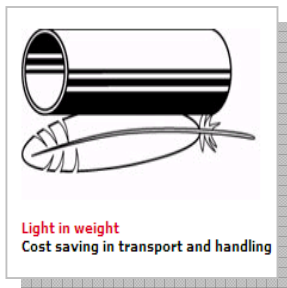
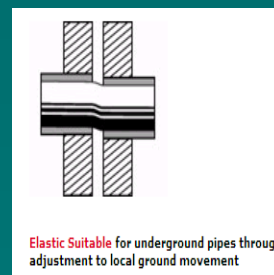
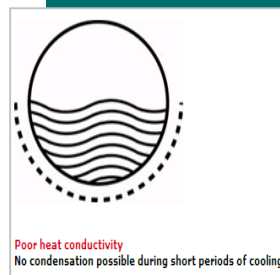
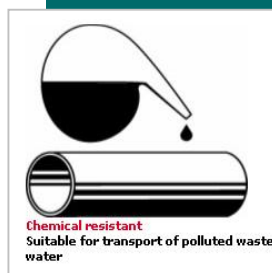
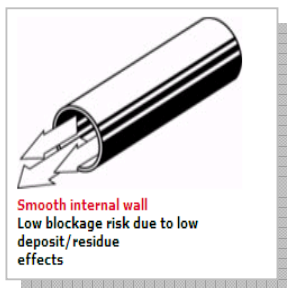
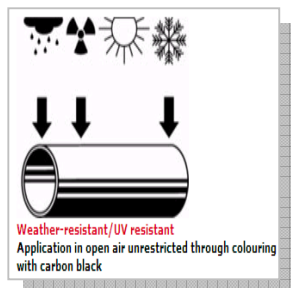


Polyethylene Polymer

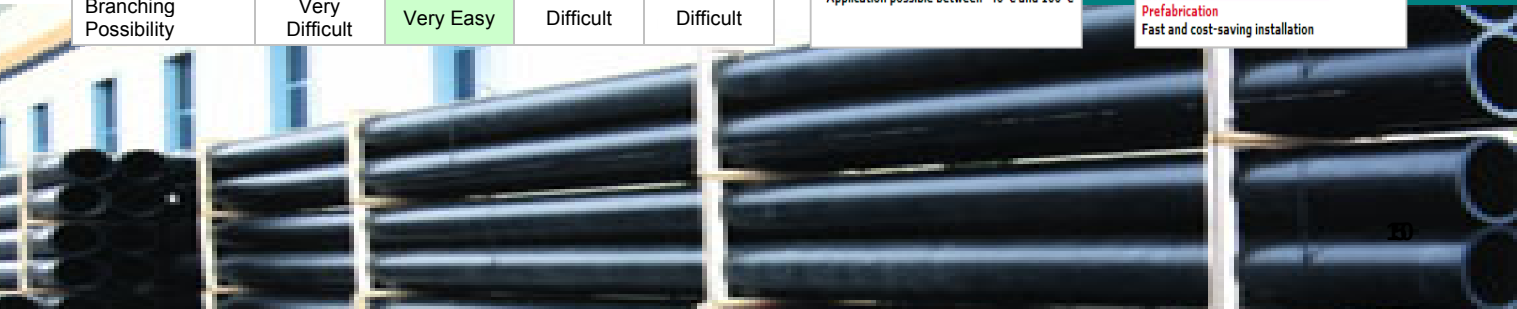
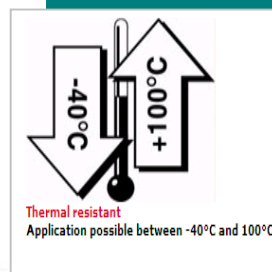
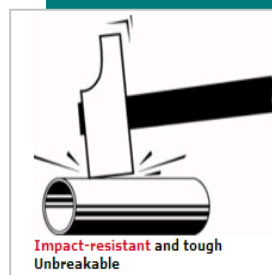


FEATURES & ADVANTAGES

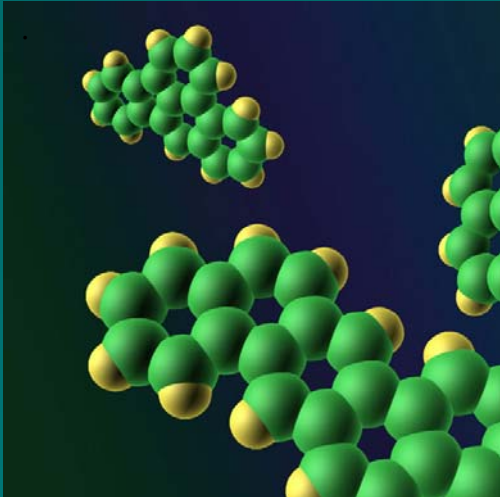
The polyethylene we manufacture has been effectively stabilized with carbon against UV radiation effects. The stabilization also serves to counteract heat fatigue, thus increasing life. Features & Advantages of PE pipes & fittings are depicted below:



Properties	PVC	PE 100	D.IRON	GRP
Brittleness Properties	Frail	Highly Resistant	Resistant	Partly Resistance
Maximum Length available (m)	6	500	6	12-Jun
Corrosion/ Abrasion Resistance	Partly Resistant	Highly Resistant	Very Frail	Frail
Hygiene	Worrisome	Excellent	Worrisome	Poor
Wall Elasticity coefficient	33	377	1	< 33
Water Hammer Damping Ability *	Poor	Excellent	Poor	Poor
Trench widening (%Pipe Diameter)	More than 110%	More than 5-10%	More than 110%	More than 200%
Bedding Necessity Around Pipe (Max:100, Min:0)	100	10	60	100
Adaptation to Ground Movement	No	Adapts	No	No
Branching Possibility	Very Difficult	Very Easy	Difficult	Difficult



SANGIR POLYETHYLENE PIPES
ENGINEERED TO BE TOUGH.



TECHNICAL SPECIFICATIONS

PROPERTIES	UNIT	Values
Density at 27°C	g/cm ³	0.958
Melt flow index MFI 190 °C/5kg	g/10 min	0.4 –1.10
Tensile strength at 27 °C	Mpa	>19min
Elongation at Break Point at 27 °C	%	>600min
Bending creep modulus	N/mm ²	800
Coefficient of linear expansion	mm/m°C	0.2

PE material for pipe extrusion is now available in three grades:

PE 63

PE 80

PE 100

These are classified based on the MRS Strength of each grade.

MRS = Minimum required strength

$\sigma = \text{MRS} / C$ - C= 1.25 FOR WATER

Long term strength	MRS (Mpa)	Classification No.	Designation	D (σ_{Mpa})
3.20-3.99	3.2	32	PE32	2.5
4.00-4.99	4	40	PE40	3.2
5.00-5.39	5	50	PE50	4
6.30-7.99	6.3	63	PE63	5
8.00-9.99	8	80	PE80	6.3
10.-11.19	10	100	PE100	8

According to international standard ISO 4427, an HDPE material can be certified as PE100, only if it passes 10000 hours Long Term Hydrostatic Strength (LTHS) test extrapolated to 50 years to show that it has a MRS of over 10 MPa for a lifetime of minimum 50 yrs.

PE100 is considered as the strongest of all PE grades for piping and therefore PE100 pipes have maximum nominal bore for the same pressure ratings for PE 80/63. Sangir manufacturers its pipes from all different grades based on customer requirements however, specializes in PE100 pipes from pre-compounded black raw material

Pipes are made in following standards per national and international norms:

- ☑ ISO 4427
- ☑ DIN 8074
- ☑ EN 12204
- ☑ IS 4984
- ☑ IS 14151
- ☑ IS 14333

PERMISSIBLE OPERATING TEMPERATURE

The values in the tables stated data apply to water. They were determined from the creep curve taking into account a safety coefficient of $C = 1.25$.

Temperature Deg C	Operation period	Standard Diameter-wall thickness relation (SDR)						
		41	33	26	17	11	7.4	6
		Pipe series (S)						
		20	16	12.5	8	5	3.2	2,5
		PN						
		4	5	6.3	10	16	25	32
	[years]	Permissible component operating pressure ^{1) 2)} [bar]						
10	5	5.0	6.3	7.9	12.6	20.2	31.5	40.4
	10	4.9	6.2	7.8	12.4	19.8	31.0	39.7
	25	4.8	6.0	7.6	12.1	19.3	30.2	38.7
	50	4.7	5.9	7.5	11.9	19.0	29.7	38.0
	100	4.6	5.8	7.3	11.6	18.7	29.2	37.4
20	5	4.2	5.3	6.6	10.6	16.9	26.9	26.5
	10	4.1	5.2	6.5	10.4	16.6	16.6	26.0
	25	4.0	5.0	6.4	10.1	16.2	16.2	25.4
	50	4.0	5.0	6.3	10.0	16.0	16.0	25.0
	100	3.9	4.9	6.1	9.8	15.7	15.7	14.5
30	5	3.6	4.5	5.6	9.0	14.4	22.5	28.8
	10	3.5	4.4	5.5	8.8	14.0	22.1	28.3
	25	3.4	4.3	5.4	8.6	13.8	21.6	27.6
	50	3.3	4.2	5.3	8.4	13.5	21.2	27.1
40	5	3.0	3.8	4.8	7.7	12.3	19.3	24.7
	10	3.0	3.8	4.7	7.6	12.1	19.0	24.3
	25	2.9	3.7	4.6	7.4	11.8	18.5	23.7
	50	2.9	3.6	4.5	7.2	11.6	18.2	23.3
50	5	2.6	3.3	4.2	6.7	10.7	16.7	21.4
	10	2.6	3.2	4.0	6.5	10.4	16.2	20.3
	15	2.3	2.9	3.7	5.9	9.5	14.8	19.0
60	5	1.9	2.4	3.0	4.8	7.7	12.1	15.5
70	2	1.5	1.9	2.4	3.9	6.2	9.8	12.5

1. We recommend for the calculation of the operating pressure in piping systems to multiply the in the table contained operating pressure with a system reduction coefficient $f_s=0.8$ (this value contains installation- technical influences such as welding joint, flange or also bending loads.).

2. These operating pressure have to be reduced by the reducing coefficients for every application.



APPLICATIONS

PE pipes and fittings have versatile usage on several different industries from simple usage in Agriculture to high end use in Chemical Industries.



Municipal



Industrial



Marine/Dredging



Agriculture



Residential



Sanitation



Mining



Irrigation



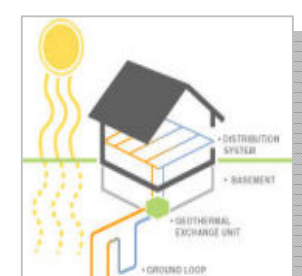
Electrical



Recreation



Infrastructure



Geo Thermal Heating



Aquaculture



Culverts

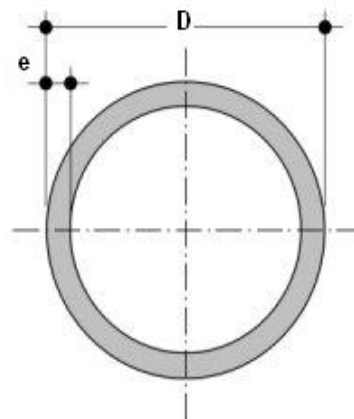


Ventilation



Float docks

HDPE & MDPE Pipes as Per ISO 4427 - PE 80, PE100



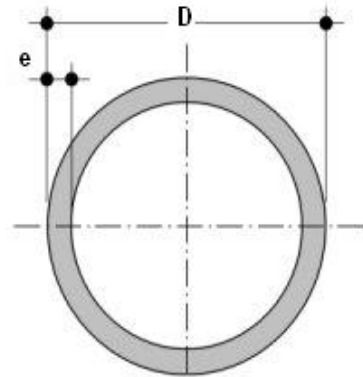
Wall thickness Chart

Dimensions in mm

SDR	SDR41		SDR33		SDR26		SDR21		SDR17		SDR13.6		SDR11		SDR9	
Series	S 20		S 16		S 12.5		S 10		S 8		S 6.3		S 5		S 4	
PE 63	PN2.5		PN3.2		PN4		PN5		PN8		PN10		PN12.5		PN16	
PE 80	PN3.2		PN4		PN5		PN6		PN8		PN10		PN12.5		PN16	
PE100	PN4		PN5		PN6		PN8		PN10		PN12.5		PN16		PN20	
Size	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0	2.3
20	-	-	-	-	-	-	-	-	-	-	-	-	2.0	2.3	2.3	2.7
25	-	-	-	-	-	-	-	-	-	-	2.0	2.3	2.3	2.7	3.0	3.4
32	-	-	-	-	-	-	-	-	2.0	2.3	2.4	2.8	3.0	3.4	3.6	4.1
40	-	-	-	-	-	-	2.0	2.3	2.4	2.8	3.0	3.5	3.7	4.2	4.5	5.1
50	-	-	-	-	2.0	2.3	2.4	2.8	3.0	3.4	3.7	4.2	4.6	5.2	5.6	6.3
63	-	-	-	-	2.5	2.9	3.0	3.4	3.8	4.3	4.7	5.3	5.8	6.5	7.1	8.0
75	-	-	-	-	2.9	3.3	3.6	4.1	4.5	5.1	5.6	6.3	6.8	7.6	8.4	9.4
90	-	-	-	-	-	-	3.5	4.0	5.4	6.1	6.7	7.5	8.2	9.2	10.1	11.3
110	-	-	-	-	4.2	4.8	5.3	6.0	6.6	7.4	8.1	9.1	10.0	11.1	12.3	13.7
125	-	-	-	-	4.8	5.4	6.0	6.7	7.4	8.3	9.2	10.3	11.4	12.7	14.0	15.6
140	-	-	-	-	5.4	6.1	6.7	7.5	8.3	9.3	10.3	11.5	12.7	14.1	15.7	17.4
160	-	-	-	-	6.2	7.0	7.7	8.6	9.5	10.6	11.8	13.1	14.6	16.2	17.9	19.8
180	-	-	-	-	6.9	7.7	8.6	9.6	10.7	11.9	13.3	14.8	16.4	18.2	20.1	22.3
200	-	-	-	-	7.7	8.6	9.6	10.7	11.9	13.2	14.7	16.3	18.2	20.2	22.4	24.8
225	-	-	-	-	8.6	9.6	10.8	12.0	13.4	14.9	16.6	18.4	20.5	22.7	25.2	27.9
250	-	-	-	-	9.6	10.7	11.9	13.2	14.8	16.4	18.4	20.4	22.7	25.1	27.9	30.8
280	-	-	-	-	10.7	11.9	13.4	14.9	16.6	18.4	20.6	22.8	25.4	28.1	31.3	34.6
315	7.7	8.6	9.7	10.8	12.1	13.5	15.0	16.6	18.7	20.7	23.2	25.7	28.6	31.6	35.2	38.9
355	8.7	9.7	10.9	12.1	13.6	15.1	16.9	18.7	21.1	23.4	26.1	28.9	32.2	35.6	39.7	43.8
400	9.8	10.9	12.3	13.7	15.3	17.0	19.1	21.2	23.7	26.2	29.4	32.5	36.3	40.1	44.7	49.3
450	11.0	12.2	13.8	15.3	17.2	19.1	21.5	23.8	26.7	29.5	33.1	36.6	40.9	45.1	50.3	55.5
500	12.3	13.7	15.3	17.0	19.1	21.2	23.9	26.4	29.7	32.8	36.8	40.6	45.4	50.1	55.8	61.5
560	13.7	15.2	17.2	19.1	21.4	23.7	26.7	29.5	33.2	36.7	41.2	45.5	50.8	56.0	-	-
630	15.4	17.1	19.3	21.4	24.1	26.7	30.0	33.1	37.4	41.3	46.3	51.1	57.2	63.1	-	-

PN values are based on C = 1,25. SDR – Standard Dimension Ratio Pipe OD to wall thickness.

HDPE Pipes as Per IS 4984:1995 , PE100 Grade



Dimensions in mm

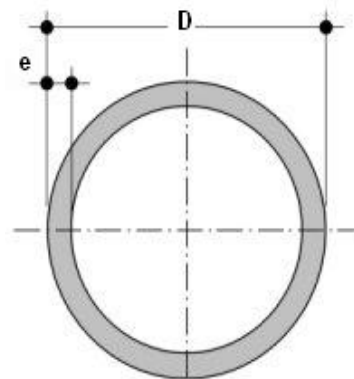
Wall thickness Chart

SDR	SDR21		SDR17.6		SDR13.6		SDR11		SDR9	
	PN6		PN8		PN10		PN12.5		PN16	
Size	e _{min}	e _{max}	e _{min}	e _{max}	e _{min}	e _{max}	e _{min}	e _{max}	e _{min}	e _{max}
16										
20	-	-	-	-	-	-	-	-	2.3	2.8
25	-	-	-	-	-	-	2.3	2.8	2.9	3.4
32	-	-	-	-	2.4	2.9	2.9	3.4	3.7	4.3
40	-	-	2.4	2.9	3.0	3.5	3.7	4.3	4.6	5.3
50	2.3	2.8	3.0	3.5	3.7	4.3	4.6	5.3	5.7	6.5
63	2.9	3.4	3.8	4.4	4.7	5.4	5.7	6.5	7.1	8.1
75	3.5	4.1	4.5	5.2	5.6	6.4	6.8	7.7	8.5	9.6
90	4.1	4.8	5.4	6.2	6.7	7.6	8.2	9.3	10.2	11.5
110	5.0	5.7	6.6	7.5	8.1	9.2	10.0	11.2	12.4	13.9
125	5.7	6.5	7.5	8.5	9.2	10.4	11.3	12.7	14.1	15.8
140	6.4	7.3	8.4	9.5	10.3	11.6	12.7	14.2	15.8	17.6
160	7.3	8.3	9.6	10.8	11.8	13.2	14.5	16.2	18.1	20.2
180	8.2	9.3	10.8	12.1	13.3	14.9	16.3	18.2	20.3	22.6
200	9.1	10.3	12.0	13.4	14.8	16.5	18.1	20.2	22.6	25.1
225	10.3	11.6	13.5	15.1	16.6	18.5	20.4	22.7	25.4	28.2
250	11.4	12.8	15.0	16.7	18.4	20.5	22.6	25.1	28.2	31.3
280	12.8	14.3	16.8	18.7	20.6	22.9	25.3	28.1	31.6	35.0
315	14.4	16.1	18.9	21.0	23.2	25.8	28.5	31.6	35.5	39.3
355	16.2	18.1	21.2	23.6	26.2	29.1	32.1	35.6	40.0	44.2
400	18.2	21.2	23.9	27.7	29.5	34.2	36.2	41.9	45.1	52.1
450	20.5	23.8	26.9	31.2	33.1	38.3	40.7	47.1	50.8	58.7
500	22.8	26.5	29.9	34.6	36.8	42.6	45.2	52.2	56.4	65.1
560	25.5	29.6	33.5	38.8	41.2	47.6	50.6	58.4		
630	28.7	33.3	37.7	43.6	46.4	53.6	56.9	65.7		

PN values are based on C = 1,25.

*Dimensions subject to change without notice

HDPE Pipes as Per IS 4984:1995, PE 80 & IS14333 PE100 Grade



Dimensions in mm

Wall thickness Chart

SDR	SDR41		SDR26		SDR17.6		SDR13.6		SDR11		SDR9		SDR7.4	
	PN2.5		PN4		PN6		PN8		PN10		PN12.5		PN16	
Size	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	-	-	-	-	-	-	-	-	-	-	2.3	2.8	2.8	3.3
25	-	-	-	-	-	-	-	-	2.3	2.8	2.8	3.3	3.5	4.1
32	-	-	-	-	-	-	2.4	2.9	3.0	3.5	3.6	4.2	4.5	5.2
40	-	-	-	-	2.3	2.8	3.0	3.5	3.7	4.3	4.5	5.2	5.6	6.4
50	-	-	2.3	2.8	2.9	3.4	3.8	4.4	4.6	5.3	5.6	6.4	6.9	7.8
63	-	-	2.5	3.0	3.6	4.2	4.7	5.4	5.8	6.6	7.0	7.9	8.7	9.8
75	-	-	2.9	3.4	4.3	5.0	5.6	6.4	6.9	7.8	8.4	9.5	10.4	11.7
90	2.3	2.8	3.5	4.1	5.1	5.9	6.7	7.6	8.2	9.3	10.0	11.2	12.5	14.0
110	2.7	3.2	4.3	5.0	6.3	7.2	8.2	9.3	10.0	11.2	12.3	13.8	15.2	17.0
125	3.1	3.7	4.9	5.6	7.1	8.1	9.3	10.5	11.4	12.8	13.9	15.5	17.3	19.3
140	3.5	4.1	5.4	6.2	8.0	9.0	10.4	11.7	12.8	14.3	15.6	17.4	19.4	21.6
160	4.0	4.6	6.2	7.1	9.1	10.3	11.9	13.3	14.6	16.3	17.8	19.8	22.1	24.6
180	4.4	5.1	7.0	7.9	10.2	11.5	13.4	15.0	16.4	18.3	20.0	22.2	24.9	27.6
200	4.9	5.6	7.7	8.7	11.4	12.8	14.9	16.6	18.2	20.3	22.3	24.8	27.6	30.6
225	5.5	6.3	8.7	9.8	12.8	14.3	16.7	18.6	20.5	22.8	25.0	27.7	31.1	34.5
250	6.1	7.0	9.7	10.9	14.2	15.9	18.6	20.7	22.8	25.3	27.8	30.8	34.5	38.2
280	6.9	7.8	10.8	12.1	15.9	17.7	20.8	23.1	25.5	28.3	31.2	34.6	38.7	42.8
315	7.7	8.7	12.2	13.7	17.9	19.9	23.4	26.0	28.7	31.8	35.0	38.7	43.5	48.1
355	8.7	9.8	13.7	15.3	20.1	22.4	26.3	29.2	32.3	35.8	39.5	43.7	49.0	54.1
400	9.8	11.5	15.4	18.0	22.7	26.4	29.7	34.4	36.4	42.1	44.5	51.4	55.2	63.7
450	11.0	12.9	17.4	20.3	25.5	29.6	33.4	38.7	41.0	47.4	50.0	57.7	-	-
500	12.2	14.3	19.3	22.4	28.4	32.9	37.1	42.9	45.5	52.6	55.6	64.1	-	-
560	13.7	16.0	21.6	25.1	31.7	36.7	41.5	48.0	51.0	58.9	-	-	-	-
630	15.4	18.0	24.3	28.2	35.7	41.3	46.7	54.0	57.3	66.1	-	-	-	-

PN values are based on C = 1,25 .

Bend 90°

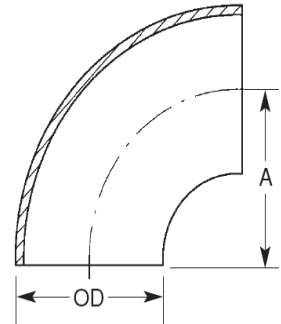
Moulded

Type : Butt Weld

Dimensions in mm

Code	OD	A
PEBE020	20	22
PEBE025	25	27
PEBE032	32	35
PEBE040	40	44
PEBE050	50	53
PEBE063	63	66
PEBE075	75	80
PEBE090	90	95
PEBE110	110	115
PEBE125	125	130
PEBE140	140	145
PEBE160	160	167
PEBE180	180	186
PEBE200	200	205

SDR rating to be specified



Tee 90°

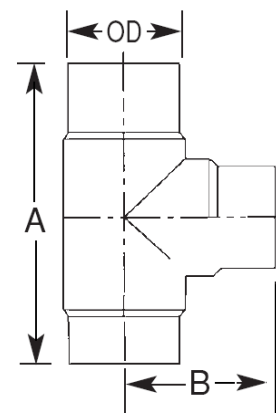
Moulded

Type : Butt Weld

Dimensions in mm

Code	OD	A	B
PETE020	20	78	38
PETE025	25	83	40
PETE032	32	87	42
PETE040	40	92	45
PETE050	50	100	50
PETE063	63	128	67
PETE075	75	150	77
PETE090	90	200	102
PETE110	110	255	128
PETE125	125	250	128
PETE140	140	314	153
PETE160	160	318	161
PETE180	180	430	214
PETE200	200	435	219

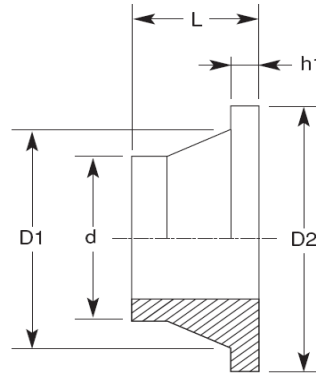
SDR rating to be specified



Stub Ends – Adaptors

Moulded

Type : Butt Weld



Dimensions in mm

Code	d	D ₁	D ₂	h ₁	L	SDR11 (e)	SDR17 (e)
PESE020	20	27	45	7	52	1.9	1.9
PESE025	25	33	58	9	53	2.3	2.3
PESE032	32	40	68	10	52	2.9	2.9
PESE040	40	50	78	11	51	3.7	3.7
PESE050	50	61	88	12	53	4.6	4.6
PESE063	63	75	95	15	50	5.8	3.6
PESE075	75	88	108	17	50	6.9	4.3
PESE090	90	103	129	18	80	8.2	5.1
PESE110	110	124	158	19	80	10.0	6.3
PESE125	125	128	158	25	80	11.4	7.1
PESE140	140	151	187	25	80	12.8	8.0
PESE160	160	168	213	26	80	14.6	9.1
PESE180	180	190	213	30	80	16.4	10.2
PESE200	200	225	270	32	95	18.2	11.4
PESE225	225	230	270	32	95	20.5	12.8
PESE250	250	284	322	35	100	22.8	14.2
PESE280	280	294	334	35	100	25.5	15.9
PESE315	315	335	380	35	100	28.7	17.9
PESE355	355	366	442	40	110	32.3	20.1
PESE400	400	420	495	45	110	36.4	22.7
PESE450	450	470	545	45	110	41.0	25.5
PESE500	500	520	596	60	125	45.5	28.4
PESE560	560	580	657	60	125	51.0	31.7
PESE630	630	650	710	60	130	57.3	35.7
PESE710	710	735	800	60	130	64.7	40.3

SDR Rating / Pipe Specs Standard to be specified

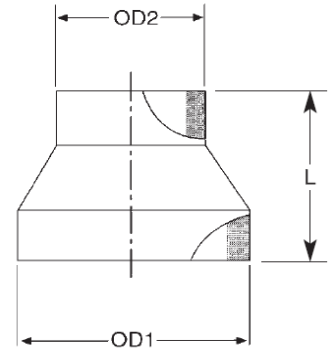
Concetric Reducers

Moulded

Type : Butt Weld

Dimensions in mm

Code	OD ₁	OD ₂	L
PECR032020	32	20	50
PECR032025	32	25	50
PECR040025	40	25	40
PECR040032	40	32	40
PECR050025	50	25	50
PECR050032	50	32	50
PECR050040	50	40	50
PECR063032	63	32	60
PECR063040	63	40	60
PECR063050	63	50	60
PECR075040	75	40	70
PECR075050	75	50	70
PECR075063	75	63	85
PECR090040	90	40	100
PECR090050	90	50	75
PECR090063	90	63	75
PECR090075	90	75	75
PECR110040	110	40	105
PECR110050	110	50	90
PECR110063	110	63	105
PECR110075	110	75	95
PECR110090	110	90	100
PECR125040	125	40	110
PECR125050	125	50	110
PECR125063	125	63	120
PECR125075	125	75	100
PECR125090	125	90	110
PECR125110	125	110	102
PECR140040	140	40	110
PECR140050	140	50	110
PECR140063	140	63	110
PECR140075	140	75	110
PECR140090	140	90	110
PECR140110	140	110	110
PECR140125	140	125	110
PECR160040	160	40	120
PECR160050	160	50	120
PECR160063	160	63	120
PECR160075	160	75	120
PECR160090	160	90	120
PECR160110	160	110	120
PECR160125	160	125	120
PECR160140	160	140	120
PECR180050	180	50	120
PECR180063	180	63	120
PECR180075	180	75	120
PECR180090	180	90	120
PECR180110	180	110	120
PECR180125	180	125	120
PECR180140	180	140	120
PECR180160	180	160	120



Code	OD ₁	OD ₂	L
PECR200050	200	50	120
PECR200063	200	63	120
PECR200075	200	75	120
PECR200090	200	90	120
PECR200110	200	110	120
PECR200125	200	125	120
PECR200140	200	140	120
PECR200160	200	160	120
PECR200180	200	180	120
PECR225090	225	90	120
PECR225110	225	110	120
PECR225125	225	125	120
PECR225140	225	140	115
PECR225160	225	160	115
PECR225180	225	180	115
PECR225200	225	200	115
PECR250090	250	90	120
PECR250110	250	110	120
PECR250125	250	125	120
PECR250140	250	140	115
PECR250160	250	160	115
PECR250180	250	180	115
PECR250200	250	200	115
PECR250225	250	225	115
PECR280090	280	90	120
PECR280110	280	110	120
PECR280125	280	125	120
PECR280140	280	140	115
PECR280160	280	160	115
PECR280180	280	180	115
PECR280200	280	200	115
PECR280225	280	225	115
PECR280250	280	250	115
PECR315090	315	90	120
PECR315110	315	110	120
PECR315125	315	125	120
PECR315140	315	140	120
PECR315160	315	160	120
PECR315180	315	180	120
PECR315200	315	200	120
PECR315225	315	225	120

Code	OD ₁	OD ₂	L
PECR315250	315	250	120
PECR315280	315	280	120
PECR355090	355	90	120
PECR355110	355	110	120
PECR355160	355	160	120
PECR355180	355	180	120
PECR355200	355	200	120
PECR355225	355	225	120
PECR355250	355	250	120
PECR355280	355	280	120
PECR355315	355	315	120
PECR400160	400	160	125
PECR400180	400	180	125
PECR400200	400	200	125
PECR400225	400	225	125
PECR400250	400	250	125
PECR400280	400	280	125
PECR400315	400	315	125
PECR400355	400	355	125
PECR450160	450	160	125
PECR450180	450	180	125
PECR450200	450	200	125
PECR450225	450	225	125
PECR450250	450	250	125
PECR450280	450	280	125
PECR450315	450	315	125
PECR450355	450	355	125
PECR500200	500	200	125
PECR500225	500	225	125
PECR500250	500	250	125
PECR500280	500	280	125
PECR500315	500	315	125
PECR500355	500	355	125
PECR500400	500	400	125
PECR500450	500	450	125
PECR560450	560	450	125
PECR560500	560	500	125
PECR630400	630	400	125
PECR630450	630	450	125
PECR630500	630	500	125
PECR630560	630	560	125

SDR Rating / Pipe Specs Standard to be specified

*Dimensions subject to change without notice

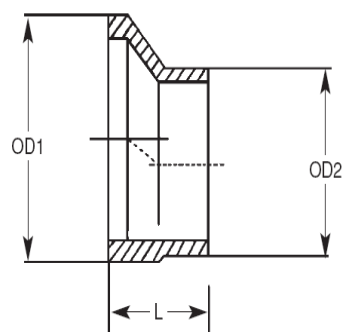
Eccentric Reducer

Moulded

Type : Butt Weld

Dimensions in mm

Code	OD ₁	OD ₂	L
PEER032020	32	20	50
PEER032025	32	25	50
PEER040025	40	25	40
PEER040032	40	32	40
PEER050025	50	25	50
PEER050032	50	32	50
PEER050040	50	40	50
PEER063032	63	32	60
PEER063040	63	40	60
PEER063050	63	50	60
PEER075040	75	40	70
PEER075050	75	50	70
PEER075063	75	63	85
PEER090040	90	40	100
PEER090050	90	50	75
PEER090063	90	63	75
PEER090075	90	75	75
PEER110040	110	40	105
PEER110050	110	50	90
PEER110063	110	63	105
PEER110075	110	75	95
PEER110090	110	90	100
PEER125040	125	40	110
PEER125050	125	50	110
PEER125063	125	63	120
PEER125075	125	75	100
PEER125090	125	90	110
PEER125110	125	110	102
PEER140040	140	40	110
PEER140050	140	50	110
PEER140063	140	63	110
PEER140075	140	75	110
PEER140090	140	90	110
PEER140110	140	110	110
PEER140125	140	125	110
PEER160040	160	40	120
PEER160050	160	50	120
PEER160063	160	63	120
PEER160075	160	75	120
PEER160090	160	90	120
PEER160110	160	110	120
PEER160125	160	125	120
PEER160140	160	140	120
PEER180050	180	50	120
PEER180063	180	63	120
PEER180075	180	75	120
PEER180090	180	90	120
PEER180110	180	110	120
PEER180125	180	125	120
PEER180140	180	140	120
PEER180160	180	160	120



Code	OD ₁	OD ₂	L
PEER200050	200	50	120
PEER200063	200	63	120
PEER200075	200	75	120
PEER200090	200	90	120
PEER200110	200	110	120
PEER200125	200	125	120
PEER200140	200	140	120
PEER200160	200	160	120
PEER200180	200	180	120
PEER225090	225	90	120
PEER225110	225	110	120
PEER225125	225	125	120
PEER225140	225	140	115
PEER225160	225	160	115
PEER225180	225	180	115
PEER225200	225	200	115
PEER250090	250	90	120
PEER250110	250	110	120
PEER250125	250	125	120
PEER250140	250	140	115
PEER250160	250	160	115
PEER250180	250	180	115
PEER250200	250	200	115
PEER250225	250	225	115
PEER280090	280	90	120
PEER280110	280	110	120
PEER280125	280	125	120
PEER280140	280	140	115
PEER280160	280	160	115
PEER280180	280	180	115
PEER280200	280	200	115
PEER280225	280	225	115
PEER280250	280	250	115
PEER315090	315	90	120
PEER315110	315	110	120
PEER315125	315	125	120
PEER315140	315	140	120
PEER315160	315	160	120
PEER315180	315	180	120
PEER315200	315	200	120
PEER315225	315	225	120

Code	OD ₁	OD ₂	L
PEER315250	315	250	120
PEER315280	315	280	120
PEER355090	355	90	120
PEER355110	355	110	120
PEER355160	355	160	120
PEER355180	355	180	120
PEER355200	355	200	120
PEER355225	355	225	120
PEER355250	355	250	120
PEER355280	355	280	120
PEER355315	355	315	120
PEER400160	400	160	125
PEER400180	400	180	125
PEER400200	400	200	125
PEER400225	400	225	125
PEER400250	400	250	125
PEER400280	400	280	125
PEER400315	400	315	125
PEER400355	400	355	125
PEER450160	450	160	125
PEER450180	450	180	125
PEER450200	450	200	125
PEER450225	450	225	125
PEER450250	450	250	125
PEER450280	450	280	125
PEER450315	450	315	125
PEER450355	450	355	125
PEER500200	500	200	125
PEER500225	500	225	125
PEER500250	500	250	125
PEER500280	500	280	125
PEER500315	500	315	125
PEER500355	500	355	125
PEER500400	500	400	125
PEER500450	500	450	125
PEER560450	560	450	125
PEER560500	560	500	125
PEER630400	630	400	125
PEER630450	630	450	125
PEER630500	630	500	125
PEER630560	630	560	125

SDR Rating / Pipe Specs Standard to be specified

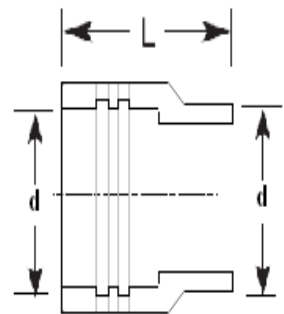
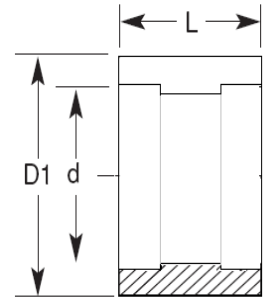
Couplers (*with Rubber Ring)

Moulded

Type : Socket

Dimensions in mm

Code	d	D1	L
PECO020	20	25	32
PECO025	25	32	35
PECO032	32	38	39
PECO040	40	48	45
PECO050	50	60	50
PECO063	63	75	58
PECO075	75	89	66
PECO090	90	106	76
PECO110	110	130	90
PECO160	160*		150
PECO180	180*		150
PECO200	200*		160
PECO180	225*		200
PECO200	250*		250



SDR Rating / Pipe Specs Standard to be specified

End Caps

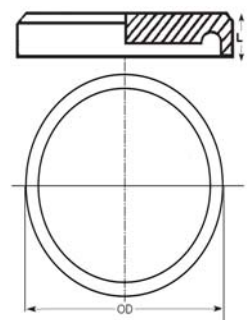
Moulded

Type : Butt Weld

Dimensions

in mm

Code	OD	L	Code	OD	L
PEEC020	20	15	PEEC225	225	50
PEEC025	25	16	PEEC250	250	50
PEEC032	32	18	PEEC280	280	55
PEEC040	40	21	PEEC315	315	60
PEEC050	50	24	PEEC355	355	65
PEEC063	63	28	PEEC400	400	70
PEEC075	75	30	PEEC450	450	80
PEEC090	90	33	PEEC500	500	85
PEEC110	110	37	PEEC560	560	95
PEEC125	125	40	PEEC630	630	105
PEEC140	140	43	PEEC710	710	50
PEEC160	160	45			
PEEC180	180	50			
PEEC200	200	50			



SDR Rating / Pipe Specs Standard to be specified

*Dimensions subject to change without notice

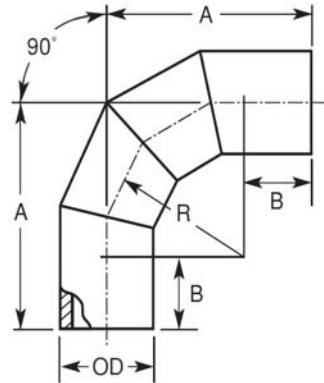
Segment Bends 90°

Fabricated

Type : Butt Weld

Dimensions in mm

Code	OD	A	B	R
PEBEF 110	110	265	100	165
PEBEF 125	125	338	150	188
PEBEF 140	140	360	150	210
PEBEF 160	160	390	150	240
PEBEF 180	180	425	150	270
PEBEF 200	200	450	150	300
PEBEF 225	225	488	150	338
PEBEF 250	250	625	250	375
PEBEF 280	280	670	250	420
PEBEF 315	315	777	300	477
PEBEF 355	355	833	300	533
PEBEF 400	400	900	300	600
PEBEF 450	450	975	300	675
PEBEF 500	500	1100	350	750
PEBEF 560	560	1190	350	840
PEBEF 630	630	1295	350	945



Long Radius, R= 2, 3 etc also available.
2 segment Bends as per IS 8360 also available

SDR Rating / Pipe Specs Standard to be specified

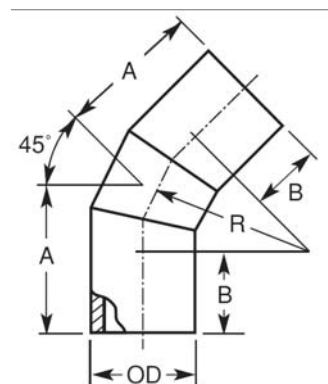
Segment Bends 45°, 60°, 30°

Fabricated

Type : Butt Weld

Dimensions in mm

Code	OD	A	B	R
PEBEF 110	110	168	100	165
PEBEF 125	125	227	150	188
PEBEF 140	140	237	150	210
PEBEF 160	160	249	150	240
PEBEF 180	180	261	150	270
PEBEF 200	200	274	150	300
PEBEF 225	225	290	150	338
PEBEF 250	250	412	250	375
PEBEF 280	280	474	250	420
PEBEF 315	315	498	300	477
PEBEF 355	355	520	300	533
PEBEF 400	400	548	300	600
PEBEF 450	450	580	300	675
PEBEF 500	500	665	350	750
PEBEF 560	560	698	350	840
PEBEF 630	630	741	350	945



5° to 90°, 120°, 150° & 180° deg bends available
Long Radius, R= 1.5, 3 etc also available.

SDR Rating / Pipe Specs Standard to be specified

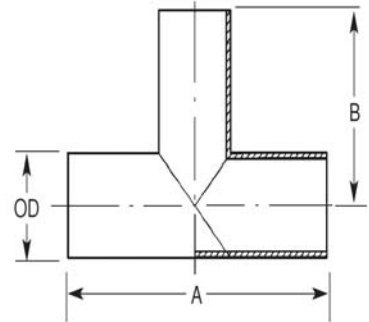
Segment Tees Equal

Fabricated

Type : Butt Weld

Dimensions in mm

Code	OD	A	B
PETEF 110	110	500	250
PETEF 125	125	500	250
PETEF 140	140	500	500
PETEF 160	160	600	500
PETEF 180	180	620	500
PETEF 200	200	650	500
PETEF 225	225	650	550
PETEF 250	250	700	650
PETEF 280	280	700	650
PETEF 315	315	800	700
PETEF 355	355	800	700
PETEF 400	400	1000	1100
PETEF 450	450	1100	1100
PETEF 500	500	1200	1200
PETEF 560	560	1200	1200
PETEF 630	630	1200	1200



Short Segment sizes per IS 8360 available.

SDR Rating / Pipe Specs Standard to be specified

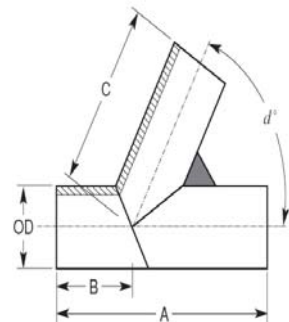
Segment Unequal/ Y

Fabricated

Type : Butt Weld

Dimensions in mm

Code	OD	A	B	C
PETEF 110	110	700	270	430
PETEF 125	125	750	300	450
PETEF 140	140	780	300	480
PETEF 160	160	850	330	520
PETEF 180	180	950	360	590
PETEF 200	200	960	370	590
PETEF 225	225	1080	420	660
PETEF 250	250	1150	450	710
PETEF 280	280	1250	500	750
PETEF 315	315	1350	530	820
PETEF 355	355	1450	570	880
PETEF 400	400	1550	600	950
PETEF 450	450	1850	650	1200
PETEF 500	500	2100	700	1400
PETEF 560	560	2200	800	1400
PETEF 630	630	2300	800	1500



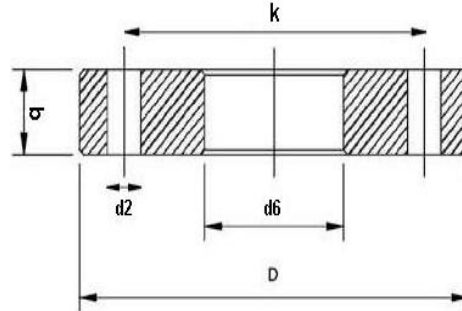
Other Custom Shapes, Spools Etc available

SDR Rating / Pipe Specs Standard to be specified

Backing Flanges

Moulded

Type : Slip-on



Dimensions in mm

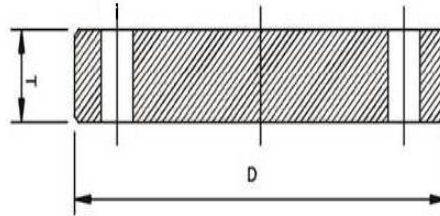
Code	ASA 150lbs, ANSI 16.5							BS 10 Table D					
	d	d6	K	D	b	d2	Bolts	d6	K	D	b	d2	Bolts
PEFS020	20	25	60	90	20	16	4 X M14	25	67	95	20	14	4 x 1/2"
PEFS025	25	30	70	100	20	16	4 X M14	30	73	102	20	14	4 x 1/2"
PEFS032	32	40	80	108	20	16	4 X M14	40	83	115	20	14	4 x 1/2"
PEFS040	40	50	89	118	20	16	4 X M14	50	87	120	20	14	4 x 1/2"
PEFS050	50	60	99	127	20	16	4 X M14	60	98	134	20	14	4 x 1/2"
PEFS063	63	73	121	153	20	19	4 X M16	73	115	152	20	14	4 x 1/2"
PEFS075	75	85	140	178	20	19	4 X M16	85	127	165	20	18	4 x 1/2"
PEFS090	90	100	152	191	20	19	4 X M16	100	146	184	20	18	8 x 5/8"
PEFS110	110	120	191	229	22	19	8 X M16	120	178	216	20	18	8 x 5/8"
PEFS125	125	135	216	254	22	23	8 X M21	135	210	254	20	18	8 x 5/8"
PEFS140	140	150	216	254	22	23	8 X M21	150	210	254	20	18	8 x 5/8"
PEFS160	160	170	241	280	24	23	8 X M21	170	235	280	20	18	8 x 5/8"
PEFS180	180	190	241	310	24	23	8 X M21	190	260	305	20	18	8 x 5/8"
PEFS200	200	210	299	343	26	23	8 X M21	210	261	305	25	18	8 x 5/8"
PEFS225	225	235	299	343	26	23	8 X M21	235	292	337	25	18	8 x 5/8"
PEFS250	250	265	362	406	30	26	12 X M24	265	356	406	30	18	8 x 5/8"
PEFS280	280	295	362	406	30	26	12 X M24	295	356	406	30	21	8 x 3/4"
PEFS315	315	330	432	483	30	26	12 X M24	330	406	457	30	21	12 x 3/4"
PEFS355	355	370	476	534	30	26	12 X M24	370	470	527	30	21	12 x 3/4"
PEFS400	400	415	540	597	35	29	12 X M26	415	521	576	35	24	12 x 7/8"
PEFS450	450	465	578	635	35	29	16 X M26	465	584	641	35	24	12 x 7/8"
PEFS500	500	515	635	700	35	32	16 X M30	515	641	705	35	24	16 x 7/8"
PEFS560	560	575	692	749	35	35	20 X M32	575	699	762	35	28	16 x 1"
PEFS630	630	645	749	814	35	35	20 X M32	645	756	825	35	28	16 x 1"

Galvanized Steel, Stainless Steel Flanges available. Table E & Table F & also
HDPE Flanges with Steel Inserts as per DIN 2501 available

Backing Flanges

Moulded

Type : Blind/Blank



Dimensions in mm

Code	ASA 150lbs, ANSI 16.5						BS 10 Table D				
	d	K	D	b	d2	Bolts	K	D	b	d2	Bolts
PEFB020	20	60	90	20	16	4 X M14	67	95	20	14	4 x 1/2"
PEFB025	25	70	100	20	16	4 X M14	73	102	20	14	4 x 1/2"
PEFB032	32	80	108	20	16	4 X M14	83	115	20	14	4 x 1/2"
PEFB040	40	89	118	20	16	4 X M14	87	120	20	14	4 x 1/2"
PEFB050	50	99	127	20	16	4 X M14	98	134	20	14	4 x 1/2"
PEFB063	63	121	153	20	19	4 X M16	115	152	20	14	4 x 1/2"
PEFB075	75	140	178	20	19	4 X M16	127	165	20	18	4 x 1/2"
PEFB090	90	152	191	20	19	4 X M16	146	184	20	18	8 x 5/8"
PEFB110	110	191	229	22	19	8 X M16	178	216	20	18	8 x 5/8"
PEFB125	125	216	254	22	23	8 X M21	210	254	20	18	8 x 5/8"
PEFB140	140	216	254	22	23	8 X M21	210	254	20	18	8 x 5/8"
PEFB160	160	241	280	24	23	8 X M21	235	280	20	18	8 x 5/8"
PEFB180	180	241	310	24	23	8 X M21	260	305	20	18	8 x 5/8"
PEFB200	200	299	343	26	23	8 X M21	261	305	25	18	8 x 5/8"
PEFB225	225	299	343	26	23	8 X M21	292	337	25	18	8 x 5/8"
PEFB250	250	362	406	30	26	12 X M24	356	406	30	18	8 x 5/8"
PEFB280	280	362	406	30	26	12 X M24	356	406	30	21	8 x 3/4"
PEFB315	315	432	483	30	26	12 X M24	406	457	30	21	12 x 3/4"
PEFB355	355	476	534	30	26	12 X M24	470	527	30	21	12 x 3/4"
PEFB400	400	540	597	35	29	12 X M26	521	576	35	24	12 x 7/8"
PEFB450	450	578	635	35	29	16 X M26	584	641	35	24	12 x 7/8"
PEFB500	500	635	700	35	32	16 X M30	641	705	35	24	16 x 7/8"
PEFB560	560	692	749	35	35	20 X M32	699	762	35	28	16 x 1"
PEFB630	630	749	814	35	35	20 X M32	756	825	35	28	16 x 1"

Galvanized Steel, Stainless Steel Flanges available. Table E & Table F & also HDPE Flanges with Steel Inserts as per DIN 2501 available

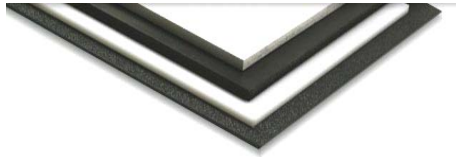
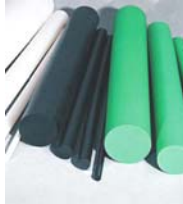
Rods & Profiles

Extruded

WELDING RODS

Dimensions in mm

Code	OD	Packing
PEWR002	2	Std Coils of 3 kgs
PEWR003	3	
PEWR004	4	
PEWR005	5	



SOLID RODS

Dimensions in mm

Code	OD	L
PESR020	20	Std Length of 1 Metre
PESR025	25	
PESR030	30	
PESR035	35	
PESR040	40	
PESR045	45	
PESR050	50	
PESR065	65	
PESR075	75	
PESR100	100	
PESR125	125	
PESR150	150	
PESR200	200	

SHEETS & BLOCKS

Dimensions in mm

Code	OD	1.22M x2.44	1.25M x2.0	1.5M X3	1.0M x2.0
PESH001	1	√	√	√	√
PESH002	2	√	√	√	√
PESH003	3	√	√	√	√
PESH004	4	√	√	√	√
PESH005	5	√	√	√	√
PESH006	6	√	√	√	√
PESH008	8	√	√	√	√
PESH010	10	√	√	√	√
PESH012	12	√	√	√	√
PESH015	15	√	√	√	√
PESH020	20	√	√	√	√
PESH025	25				√
PESH030	30				√
PESH035	35				√
PESH040	40				√
PESH050	50				√

10/20 Mtrs Rolls & Fabric Backed available in 1- 5 mm

Other Products & Services - Custom Fabrication

Sangir Plastics has a complete independent team handling on-site installation and commissioning and off-site pre-fabrication work. A dedicated workshop equipped with advanced welding equipment from European companies like Wegner and Technodue, provides high quality fabricated fittings and custom fabrication jobs in-house. Experience of several years of erection and commissioning jobs at large metallurgy and chemical companies has given the services team exposure to extreme conditions and provided successful orientation towards high quality deliverables. Sangir is able to take up turnkey jobs which would consists of designing, supplying, installation, erection and commissioning of complete piping systems with guaranteed performance for decades.

Installations completed in following industries:

- | | | | |
|--------------------------------|---------------------------|-----------------------------|---------------------------|
| 1) Zinc manufacturing units. | 2) Chemical Industry. | 3) Fluorochemical industry | 4) Phosphoric Acid Plants |
| 5) Copper manufacturing plants | 6) Waste Treatment Plants | 7) Oil manufacturing plants | 8) Nuclear Power Plants |

Custom Fabrication jobs undertaken include: Tanks, Manifolds, Vessels, Hoods, Ducts, Lined pipes etc.



SOLUTIONS FOR THE DREDGING INDUSTRY & SLURRY TRANSPORTAION

POLYETHYLENE FLANGED PIPES

Pipes coupled
with MS Flanges and
pipe-ends on both sides.

Size		Internal Bore					
ISO 4427		PE 100			PE 80		
OD(mm)	Inches	PN 6	PN 8	PN 10	PN 6	PN 8	PN 10
200	8"	184	180	175	180	175	169
225	9"	207	202	197	202	197	190
250	10"	230	225	219	225	219	211
280	11"	257	252	245	252	245	237
315	12"	289	283	276	283	276	266
355	14"	326	319	310	319	310	300
400	16"	368	360	350	360	350	338
450	18"	414	405	394	405	394	380
500	20"	460	450	437	450	437	423
560	22"	515	504	490	504	490	473
630	24"	579	567	551	567	551	533
710	26"	653	639	621	639	621	-

Size		Internal Bore					
IS 4984:95		PE 100			PE 80		
OD(mm)	Inches	PN 6	PN 8	PN 10	PN 6	PN 8	PN 10
200	8"	181	175	169	176	169	162
225	8"	203	196	190	198	190	182
250	10"	226	218	211	220	211	202
280	10"	253	245	237	246	236	226
315	12"	285	275	266	277	266	255
355	14"	321	310	300	313	300	287
400	16"	361	348	336	351	336	322
450	18"	406	392	379	395	378	362
500	20"	451	436	421	439	420	402
560	22"	505	488	471	492	471	-
630	24"	568	549	-	553	-	-
710	26"	640	619	-	623	-	-

PRECISION.
CAPABILITY.
TECHNIQUE.



FITS WELL.

Pipes are manufactured per customer specifications based on their pressure requirements, abrasion resistance requirement, scheme of operation, location of pipe installation.

We assist in offshore marine layouts and onshore laying of pipes. Our service teams are among the best in the country and use superior equipment to construct that perfect joint.



ANALYZE.
PLAN.
EXECUTE.
IMPROVE.



PE Floaters are used to keep the pipeline afloat on the sea waters. The floaters are placed adjacent to the PE pipes on either sides and the placement is secured with the help of belts that run across the circumference of the two floaters and the sandwiched pipe. Based on buoyancy requirements the floaters can be filled with low density materials like Polyurethane (PU) or Expanded Poly Styrene (EPS) popularly known as thermocol. Floaters are end capped on both sides after filling the above materials and are made water tight for best performance. Floaters are also available without the filling for areas where buoyancy is achieved by other methods or not required.

SOLUTIONS FOR THE DREDGING INDUSTRY

POLYETHYLENE END CAPPED FLOATS

TECHNICAL SPECIFICATIONS

Size		Filler Options	
		Poly Urethane	Expanded Polystyrene
OD(mm)	Inches	40-60 kg/m ³	16 kg/m ³
200	8"	☒	☒
225	9"	☒	☒
250	10"	☒	☒
280	11"	☒	☒
315	12"	☒	☒
355	14"	☒	☒
400	16"	☒	☒
450	18"	☒	☒
500	20"	☒	☒
560	22"	☒	☒
630	24"	☒	☒
710	26"	☒	☒

Other Customized Parts available:

Flange End Bends & Tees
Belts for holding floats & pipes
Connecting Flexible Hoses
PU filled ocean buoys



TECHNIQUES OF JOINING POLYETHYLENE PIPES

Among the techniques used for welding of Polyethylene – butt welding and extrusion & electro fusion welding are more commercially popular due to the easy portability of the welding machinery.

Butt Welding: This technique is used for welding pipes made from PE, PP, PVDF etc. The pipes are mounted in the clamps of the butt fusion equipment and checked for initial alignment. The pipe ends are then planed to ensure that they are flat & square. The welding sequence begins when a flat heated plate is positioned between the two pipe ends. The pipes are pushed towards each other until they come into contact with the hot plate and the pressure is increased to give good thermal contact. The pipe ends melt and the interface pressure forces the molten material outwards to form 'weld beads' at the outside and inside pipe surfaces; hence the term 'bead-up' stage. Then the pressure is reduced to a value sufficient only to maintain the pipe in contact with the hot plate. This allows the melt depth to increase without increasing the size of the weld beads. At the end of this 'heat soak' stage, the pipe ends are pulled away from the hot plate. The hot plate is removed, and the two molten pipe ends are pushed together at the same pressure as used during the initial bead-up stage. This causes further growth of the weld bead and is called the 'bead roll over' stage. The pressure is maintained until the weld is fully cooled and joint is ready.



The welding cycle is divided in 5+1 different phases:

PHASE 1: Bead formation t_1

PHASE 2: Heating up t_1

PHASE 3: Change over t_3

PHASE 4: Bringing up pressure t_4

PHASE 5: Cooling down under pressure t_5

PHASE 6: Cooling down out of the machine t_6

t_1 = Time requested for the bead formation with the specified wall thickness

t_2 = Time requested for the continual heating

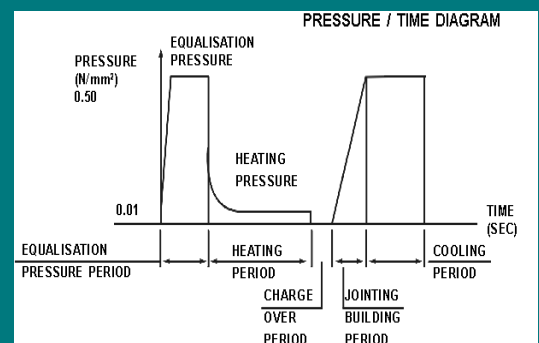
t_3 = Time requested for the change over

t_4 = Time requested for bringing up the pressure

t_5 = Time requested for cooling down

p_2 = pressure during the continual heating

p_1 = pressure during the bead formation and the cooling down



Values of butt fusion jointing process.

Pipe wall Thickness (mm.)	Heating Element Temp. °C	Equalisation At P=0.1N/mm ² Height of Bead (mm.)	Heating time at P=0.01N/mm ² for (sec) various materials			Change over time (sec.)	Time to reach full jointing pressure (sec.)	Cooling time under jointing pressure P=0.15N/mm ² (sec.)
			PP	HDPE	PVDF			
2-3.7	215	0.5	-	30-40	40-70	4	3-6	4-5
4.3-6.9	210	0.5	65-115	40-70	70-40	5	5-8	6-10
7.1-11.4	205	1.0	115-180	70-120	90-120	6	8-10	10- 20
12.2-18.2	200	1.0	180-290	120-170	120-150	8	10-15	20-30
20.1-25.5	195	1.5	290-330	170-210	-	10	15-20	25-38

Other Jointing Methods

Extrusion Welding:



The process involves continuously extruding molten thermoplastic material into a weld preparation on the plastic component or structure which is being joined. The extrusion barrel on the extrusion gun is heated along its length, either by cartridge heaters or hot air. A thermoplastic rod or granule feedstock is fed into the rear of the extrusion barrel and the material is heated as it is drawn through the barrel by the rotating extruder screw. The ejected material is shaped to match the profile being welded, and defines the shape and size of the final weld. At the leading edge, hot gas is used to ensure there is sufficient heat in the substrate material to form the weld. Typical welding speeds are 0.5-1.0 m/min. Extrusion welding is generally used to weld custom fabrications with sheet, nozzles etc.

Flange Connections:



Stub flanges/Pipe ends/ collars as butt welded to each side of a length of pipe after inserting two slip-on metal flanges (one for each side). A continuous line can then be made by simply bolting the flanges together which are held securely in place. A leak proof joint is ensured by inserting an sealing gasket thus providing a demountable joint or to match up with pumps, valves etc . Primarily used where the pipes may need cleaning later on or may have to be moved from one place to another after use.

Electro-Fusion Welding



Electro-fusion joining involves an electrically conducting implant being incorporated into the socket and/or fitting to be jointed to the pipe. A high electric current is applied via an appropriate power source and causes resistive heating which melts and fuses the pipe and fitting material.

Other methods of welding include infrared, bead and crevice free, friction welding depending on the requirements of the application and ultimate use of the manufactured product.

Storage and Transportation Handling and shortage

General Handling

Polyethylene is a resilient material, lightweight and easy to handle. Nonetheless, care should be taken not to cause scuffing or gouging of the surface. In addition to the guidelines set out here, the handling and storage of PE pipe is covered by codes of practice issued by various utilities.

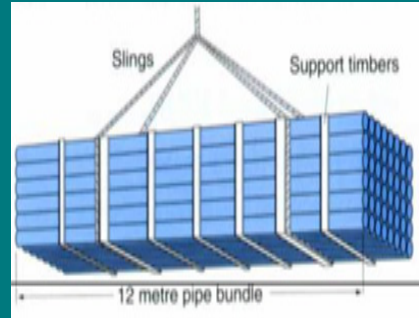
Loading and off-loading

Lengths and bundles

A flat-bed vehicle, free from sharp objects and projections should be used for transportation of pipe systems. When lifting pipe bundles by crane, wideband slings should be used; do not use chains, hooks or hawsers. For lengths greater than six metres, load-spreading beams should be inserted at equal distances apart.

Allow for a certain amount of deflection or slight bending of pipe bundles when loading or unloading. Standard six metre bundles may be handled by forklift, but longer lengths should be moved by a side-loader with a minimum of four supporting forks or by a crane with a spreader beam. Individual lengths should be handled similarly.

Off-loading on site will be eased by skid timbers and rope slings.



Coils

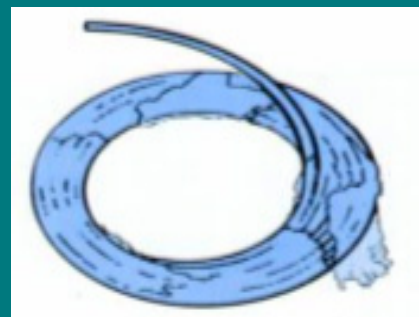
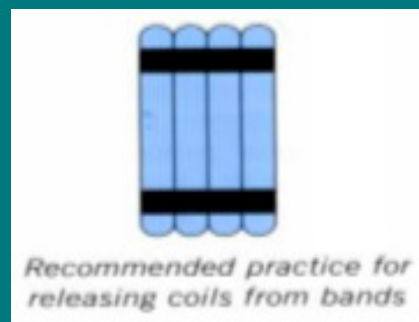
Small coils of pipe strapped on to pallets are easily handled by forklift. Larger coils of 125mm or 180mm pipe will require lifting individually by forklift

Releasing coils

Safety first: Pipe held in coils is under tension and is strapped accordingly. These may be hazardous if released in the incorrect manner - particularly if the end of the pipe is not kept restrained at all times. It is most important to read and understand the following guidelines before attempting to release coils. Coils are secured by one of two methods depending on the pipe's diameter:

1- Outer bands with additional strapping of individual layers. Do not remove any of these bands until pipe is required for use. Remove them carefully, from the outermost layer first, so that only the length of pipe needed immediately is released. Successive layers can be released by removing banding as the pipe is drawn away from the coil.

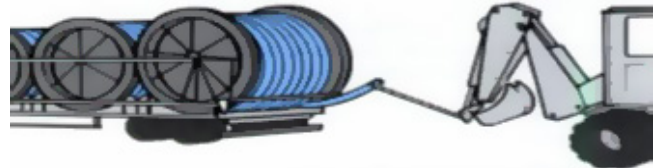
2. Wrapped coils of pipe of 32mm and below have external layers of filmwrap, enabling the free end of the pipe to be taken from inside the coil. Take only sufficient pipe for immediate use from the coil and on no account remove the outer wrapping until the coil is almost fully unwound.



Storage and Transportation Handling and shortage

Drums

Drums are delivered direct to site on a low loader and the pipe is usually dispensed from the drum by pulling off with a machine such as a JCB. The inner end of the pipe is restrained at the hub of the drum, and although drummed pipe has less energy locked into it than coils, caution is required when parting the pipe end from the drum. For safety, we recommend that the end of the pipe should be tethered to the dispensing machine when it is unhooked from the drum. This will prevent potentially dangerous springing.



Recommended practice for off-loading drums

Fittings

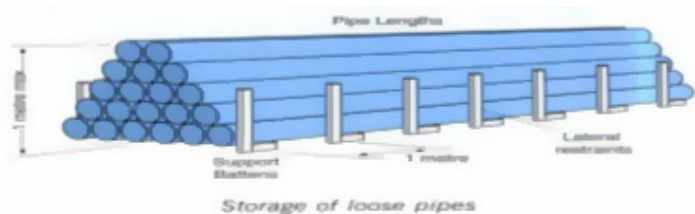
Never use hooks to lift fittings. Make sure that the tines on forklift trucks are adequately covered (eg. by scrap PE pipe offcuts).

Storage

Badly stacked pallets, coils or bundles may slip or collapse, causing injury to personnel or damage to the pipe. Pipe-end caps, intended to prevent ingress of contamination, should be kept in place during storage.

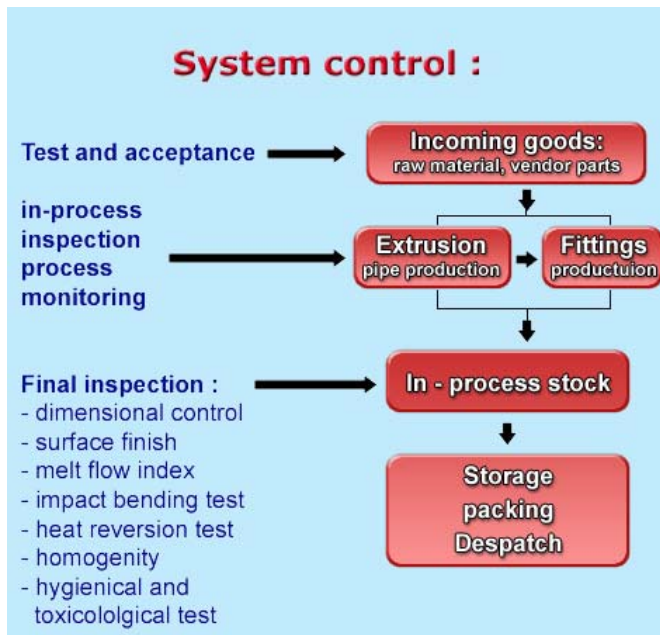
Lengths

pipe lengths stored individually should be stacked in a pyramid not more than one metre high, with the bottom layer fully restrained by wedges. Where possible, the bottom layer of pipes should be laid on timber battens at one-metre centres. On site, pipes may be laid out individually in strings. (Where appropriate, protective barriers should be placed with adequate warning signs and lamps.)



Storage of loose pipes

Quality Assurance Plan



HDPE pressure pipeline testing

It is always advisable to out the PE pipeline testing before the covering. Generally the testing are carried out sectioning parts of proper length, Which must be closed with suitable systems.

For example, with blank flanges provided with connections for pressure gauge, pump, breathers, etc.

The pipeline must be anchored avoiding the movement of under pressure pipelines, and proceeding with partial trench covering leaving the joints uncovered for further inspection. The pipeline is filled with water from the most low-laying point where the manometer must be

installed. Particular care is applied for the out coming of air from breathers, cocks, etc.

The pipeline is placed under pressure at a value up to 1,5 times the nominal pressure at 20°C for 1 hour.

If there is a pressure loss, it is important to measure the necessary quantity of water to restore the testing pressure.

This quantity must not exceed the water quantity, derived from the formula:

$$QH_{20} = 0,125 \times L / 1000 \times P / 3 \times D / 25 \times N$$

Where:

L = length in meters

P = testing pressure in bar

D = inside diameters in millimeters

N = number of hours

If the testing at 1 hour is positive, that of 12 hours will follow for the same pressure value, with check carried out with above calculation.



INSTALLATION INFORMATION

Support Distances

Expansion & Contraction

For above ground pipelines, expansion and contraction movements should be taken up by the pipeline where possible without expansion joints.

This may be achieved in lines laid directly on the natural surface by snaking the pipe during installation and allowing the pipe to move freely in service. Where the final joint connections are made in high ambient temperature sufficient pipe length must be allowed to permit the pipe to cool, and hence contract without pulling out of non end load bearing joints.

DN	SDR41	SDR33	SDR26	SDR21	SDR17	SDR13.6	SDR11	SDR9	SDR7.4
16	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
20	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.65	0.65
25	0.65	0.65	0.65	0.65	0.65	0.70	0.70	0.75	0.75
32	0.70	0.70	0.70	0.70	0.75	0.80	0.85	0.90	0.90
40	0.80	0.80	0.80	0.80	0.90	0.90	1.00	1.00	1.10
50	0.85	0.85	0.90	0.95	1.00	1.10	1.15	1.20	1.25
63	0.95	1.00	1.05	1.10	1.20	1.25	1.30	1.40	1.45
75	1.00	1.10	1.20	1.25	1.35	1.40	1.50	1.55	1.60
90	1.15	1.25	1.35	1.40	1.50	1.60	1.65	1.75	1.80
110	1.35	1.40	1.55	1.60	1.70	1.80	1.90	2.00	2.10
125	1.45	1.55	1.65	1.75	1.85	2.00	2.10	2.20	2.30
140	1.55	1.65	1.80	1.90	2.00	2.10	2.25	2.35	2.45
160	1.70	1.80	1.95	2.10	2.20	2.30	2.45	2.55	2.65
180	1.85	1.95	2.10	2.25	2.35	2.50	2.65	2.80	2.90
200	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00	3.10
225	2.15	2.30	2.45	2.60	2.75	2.90	3.05	3.20	3.35
250	2.30	2.45	2.60	2.75	2.95	3.10	3.30	3.45	3.60
280	2.45	2.65	2.80	3.00	3.20	3.35	3.55	3.70	3.90
315	2.65	2.85	3.05	3.25	3.45	3.65	3.85	4.05	4.20
355	2.90	3.10	3.30	3.50	3.75	3.95	4.15	4.35	4.55
400	3.10	3.35	3.55	3.80	4.05	4.25	4.50	4.70	4.90
450	3.40	3.60	3.85	4.10	4.35	4.60	4.85	5.10	5.35
500	3.60	3.85	4.15	4.40	4.75	4.95	5.20	5.50	
560	3.90	4.15	4.50	4.75	5.05	5.35			
630	4.20	4.50	4.85	5.15	5.45	5.80			
710	4.60	4.90	5.25	5.60	5.95	6.30			



CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHYLENE

S- Satisfactory
U – Unsatisfactory
M – Marginal
N - Not known

All concentrations are 100% unless noted otherwise.
 On chemicals marked marginal, chemical attack will be recognized by a loss of physical properties of the pipe which may require a change in design factors.

Chemical	70°F	140°F
	21°C	60°C
Acetic Acid 1-10%	S	S
Acetic Acid 10-60%	S	M
Acetic Acid 80-100%	S	M
Acetone	M	U
Acrylic Emulsions	S	S
Aluminum Chloride-Dilute	S	S
Aluminum Chloride Conc.	S	S
Aluminum Fluoride Conc.	S	S
Aluminum Sulfate Conc.	S	S
Alums (All Types) Conc.	S	S
Ammonia 100% Dry Gas	S	S
Ammonium Carbonate	S	S
Ammonium Chloride Sat'd	S	S
Ammonium Fluoride 20%	S	S
Ammonium Hydroxide 0.8S S.G.	S	S
Ammonium Metaphosphate Sat'd	S	S
Ammonium Nitrate Sat'd	S	S
Ammonium Persulfate Sat'd	S	S
Ammonium Sulfate Sat'd	S	S
Ammonium Sulfide Sat'd	S	S
Ammonium Thiocyanate Sat'd	S	S
Amyl Acetate	M	U
Amyl Alcohol 100%	S	S
Amyl Chloride 100%	N	U
Aniline 100%	S	N
Antimony Chloride	S	S
Aqua Regia	U	U
Barium Carbonate Sat'd	S	S
Barium Chloride	S	S
Barium Hydroxide	S	S
Barium Sulfate Sat'd	S	S
Barium Sulfide Sat'd	S	S
Beer	S	S
Benzene	M	U
Benzene Suffonic Acid	S	S
Bismuth Carbonate Sat'd	S	S

Chemical	70°F	140°F
	21°C	60°C
Bleach Lye 10%	S	S
Black Liquor	S	S
Borax Cold Sat'd	S	S
Boric Acid Dilute	S	S
Boric Acid Conc.	S	S
Bromic Acid 10%	S	S
Bromine Liquid 100%	M	U
butanediol 10%	S	S
butanediol 60%	S	S
butanediol 100%	S	S
butyl Alcohol 100%	S	S
Calcium Bisulfide	S	S
Calcium Carbonate Sat'd	S	S
Calcium Chlorate Sat'd	S	S
Calcium Chloride Sat'd	S	S
Calcium Hydroxide	S	S
Calcium Hypochlorite RRGH	S	S
Calcium Nitrate 50%	S	S
Calcium Sulfate	S	S
Camphor Oil	N	U
Carbon Dioxide 100% Dry	S	S
Carbon Dioxide 100%Wet	S	S
Carbon Dioxide Cold Sat'd	S	S
Carbon Disulfide	N	U
Carbon Monoxide	S	S
Carbon Tetrachloride	M	U
Carbonic Acid	S	S
Castor Oil Conc.	S	S
Chlorine Dry Gas 100%	S	M
Chlorine Moist Gas	M	U
Chlorine Liquid	M	U
Chlorobenzene	M	U
Chloroform	M	U
Chlorosulfonic Acid 100%	M	U
Chrome Alum Sat'd	S	S
Chromic Acid 20%	S	S

Chemical	70°F	140°F
	21°C	60°C
Chromic Acid Up to 50%	S	S
Chromic Acid and Sulfuric Acid	S	M
Cider	S	S
Citric Acid Sat'd	S	S
Coconut Oil Alcohols	S	S
Cola Concentrates	S	S
Copper Chloride Sat'd	S	S
Copper Cyanide Sat'd	S	S
Copper Fluoride 2%	S	S
Copper Nitrate Sat'd	S	S
Copper Sulfate Dilute	S	S
Copper Sulfate Sat'd	S	S
Cottonseed Oil	S	S
Crude Oil	S	M
Cuprous Chloride Sat'd	S	S
Cychohexanol	S	S
Cyclohexanone	M	U
Detergents Synthetic	S	S
Developers, Photographic	S	S
Dextrin Sat'd	S	S
Dextrose Sat'd	S	S
Dibutylphthalate	S	M
Disodium Phosphate	S	S
Diazo Salts	S	S
Diethylene Glycol	S	S
Diglycolic Acid	S	S
Dimethylamine	M	U
Emulsions, Photographic	S	S
Ethyl Acetate 100%	M	U
Ethyl Alcohol 100%	S	S
Ethyl Alcohol 35%	S	S
Ethyl butyrate	M	U
Ethyl Chloride	M	U
Ethyl Ether	U	U
Ethylene Chloride	U	U
Ethylene Chlorohydrin	U	U

CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHYLENE

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 On chemicals marked marginal, chemical attack will be recognized
 by a loss of physical properties of the pipe which may
 require a change in design factors.

Chemical	70°F	140°F
	21°C	60°C
Ethylene Dichloride	M	U
Ethylene Glycol	S	S
Ferric Chloride Sat'd	S	S
Ferric Nitrate Sat'd	S	S
Ferrous Chloride Sat'd	S	S
Ferrous Sulfate	S	S
Fish Solubles	S	S
Fluoboric Acid	S	S
Fluorine	S	U
Fluosilicic Acid 32%	S	S
Fluosilicic Acid Conc.	S	S
Formaldehyde 40%	S	N
Formic Acid 0-20%	S	S
Formic Acid 20-50%	S	S
Formic Acid 100%	S	S
Fructose Sat'd	S	S
Fruit Pulp	S	S
Fuel Oil	S	U
Furfural 100%	M	U
Furfuryl Alcohol	M	U
Gallic Acid Sat'd	S	S
Gas Liquids	S	M
Gasoline	M	U
Gin	S	U
Glucose	S	S
Glycerine	S	S
Glycol	S	S
Glycolic Acid 30%	S	S
Grape Sugar Sat'd Aq.	S	S
Hexanol, Tert.	S	S
Hydrobromic Acid 50j/O	S	S
Hydrocyanic Acid Sat'd	S	S
Hydrochloric Acid 10%	S	S
Hydrochloric Acid 30%	S	S
Hydrochloric Acid 35%	S	S
Ethylene Dichloride	M	U

Chemical	70°F	140°F
	21°C	60°C
Hydrochloric Acid Conc.	S	S
Hydrofluoric Acid 40%	S	S
Hydrofluoric Acid 60%	S	S
Hydrofluoric Acid 75%	S	S
Hydrogen 100%	S	S
Hydrogen Bromide 10%	S	S
Hydrogen Chloride Gas Dry	S	S
Hydrogen Peroxide 30%	S	S
Hydrogen Peroxide 90%	S	M
Hydrogen Phosphide 100%	S	S
Hydroquinone	S	S
Hydrogen Sulfide	S	S
Hypochlorus Acid Conc.	S	S
Inks	S	S
Lodine (Alc. Sol.) Conc.	S	U
Lactic Acid 10%	S	S
Lactic Acid 90j/O	S	S
Latex	S	S
Lead Acetate Sat'd	S	S
Lube Oil	S	M
Magnesium Carbonate Sat'd	S	S
Magnesium Chloride Sat'd	S	S
Magnesium Hydroxide Sat'd	S	S
Magnesium Nitrate Sat'd	S	S
Magnesium Sulfate Sat'd	S	S
Mercuric Chloride Sat'd	S	S
Mercuric Cyanide Sat'd	S	S
Mercurous Nitrate Sat'd	S	S
Mercury	S	S
Methyl Alcohol 100%	S	S
Methyl Bromide	M	U
Methyl Chloride	M	U
Methyl Ethyl Ketone 100%	M	U
Methylsulfuric Acid	S	S
Methylene Chloride 100%	M	U
Hydrochloric Acid Conc.	S	S

Chemical	70°F	140°F
	21°C	60°C
Milk	S	S
Mineral Oils	S	U
Molasses Comm.	S	S
Nickel Chloride Sat'd	S	S
Nickel Nitrate Conc.	S	S
Nickel Sulfate Sat'd	S	S
Nicotine Dilute	S	S
Nicotinic Acid	S	S
Nitric Acid 0-30%	S	S
Nitric Acid 30-50%	S	M
Nitric Acid 70%	S	M
Nitric Acid 95-98%	U	U
Nitrobenzene 100%	U	U
Octyl Cresol	S	U
Oils and Fats	S	M
Oleic Acid Conc.	S	U
Oleum Conc.	U	U
Orange Extract	S	S
Oxalic Acid Dilute	S	S
Oxalic Acid Sat'd	S	S
Ozone 100%	S	U
PerchloneAcid 10%	S	S
Petroleum Ether	U	U
Phenol 90%	U	U
Phosphoric Acid Up to 30%	S	S
Phosphoric Acid Over 30%	S	S
Phosphoric Acid 90%	S	S
Phosphorous (Yellow) 100%	S	N
Phosphorus Pentoxide 100%	S	N
Photographic Solutions	S	S
Pickling Baths		
Sulfuric Acid	S	S
Hydrochloric Acid	S	S
Sulfuric-Nitric	S	U
Plating Solutions		
Milk	S	S

CHEMICAL RESISTANCE OF HIGH DENSITY POLYETHYLENE

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All concentrations are 100% unless noted otherwise.
 On chemicals marked marginal, chemical attack will be recognized
 by a loss of physical properties of the pipe which may
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Chemical	70°F	140°F
	21°C	60°C
Brass	S	S
Cadmium	S	S
Chromium	N	N
Copper	S	S
Gold	S	S
Indium	S	S
Lead	S	S
Nickel	S	S
Rhodium	S	S
Silver	S	S
Tin	S	S
Zinc	S	S
Potassium Bicarbonate Sat'd	S	S
Potassium Borate 1%	S	S
Potassium Bromate 10%	S	S
Potassium Bromide Sat'd	S	S
Potassium Carbonate	S	S
Potassium Chlorate Sat'd	S	S
Potassium Chloride Sat'd	S	S
Potassium Chromate 40%	S	S
Potassium Cyanide Sat'd	S	S
Potassium Dichromate 40%	S	S
Potassium Ferri/Ferro Cyanide Sat'd	S	S
Potassium Fluoride	S	S
Potassium Hydroxide 20%	S	S
Potassium Hydroxide Conc.	S	S
Potassium Nitrate Sat'd	S	S
Potassium Perborate Sat'd	S	S
Potassium Perchlorate 10%	S	S
Potassium Sulfate Conc.	S	S
Potassium Sulfide Conc.	S	S
Potassium Sulfite Conc.	S	S
Potassium Persulfate Sat'd	S	S
Propargyl Alcohol	S	S
Propyl Alcohol	S	S
Brass	S	S

Chemical	70°F	140°F
	21°C	60°C
Propylene Dichloride 100%	U	U
Propylene Glycol	S	S
Rayon Coagulating Bath	S	S
Sea Water	S	S
Selenic Acid	S	S
Shortening	S	S
Silicic Acid	S	S
Silver Nitrate Sol.	S	S
Soap Solution Any Conc'n	S	S
Sodium Acetate Sat'd	S	S
Sodium Benzoate 35%	S	S
Sodium Bicarbonate Sat'd	S	S
Sodium Bisulfate Sat'd	S	S
Sodium Bisulfite Sat'd	S	S
Sodium Borate	S	S
Sodium Bromide Dilute Sol.	S	S
Sodium Carbonate Con.	S	S
Sodium Carbonate	S	S
Sodium Chlorate Sat'd.	S	S
Sodium Chloride Sat'd	S	S
Sodium Cyanide	S	S
Sodium Dichromate Sat'd	S	S
Sodium Ferrocyanide	S	S
Sodium Ferrocyanide Sat'd	S	S
Sodium Fluoride Sat'd	S	S
Sodium Hydroxide Conc.	S	S
Sodium Hypochlorite	S	S
Sodium Nitrate	S	S
Sodium Sulfate	S	S
Sodium Sulfide 25%	S	S
Sodium Sulfide Sat'd Sol.	S	S
Sodium Sulfite Sat'd	S	S
Stannous Chloride Sat'd	S	S
Stannic Chloride Sat'd	S	S
Starch Solution SaUd	S	S
Propylene Dichloride 100%	U	U

Chemical	70°F	140°F
	21°C	60°C
Steanc Acid 100%	S	S
Sulfuric Acid 0-50%	S	S
Sulfuric Acid 70%	S	M
Sulfuric Acid 80%	S	U
Sulfuric Acid 96%	M	U
Sulfuric Acid 98%	M	U
Sulfuric Acid, Fuming	U	U
Sulfurous Acid	S	S
Tallow	S	M
Tannic Acid 10%	S	S
Tanning Extracts Comm.	S	S
Tartaric Acid Sat'd	N	N
Tetrahydrofurane	N	U
Titanium Tetrachloride Sat'd	N	U
Toluene	M	U
Transformer Oil	S	M
Trisodium Phosphate Sat'd	S	S
Trichloroethylene	U	U
Urea Up to 30%	S	S
Urine	S	S
Vinegar Comm.	S	S
Vanilla Extract	S	S
Wetting Agents	S	S
Whiskey	S	N
Wines	S	S
Xylene	M	U
Yeast	S	S
Zinc Chloride Sat'd	S	S
Zinc Sulfate Sat'd	S	S

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Bureau Veritas Pvt. Ltd
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Government bodies

National Thermal Power Corporation Ltd.
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Gujarat Water Sewerage & Supply Board
Municipal Corporation of Greater Mumbai Ltd.
Bureau of Indian Standards
Mahanagar Gas Ltd

IS 14333:1996



CM/L-7754389

IS 4984:1995



CM/L - 1285855

IS 14151:1999



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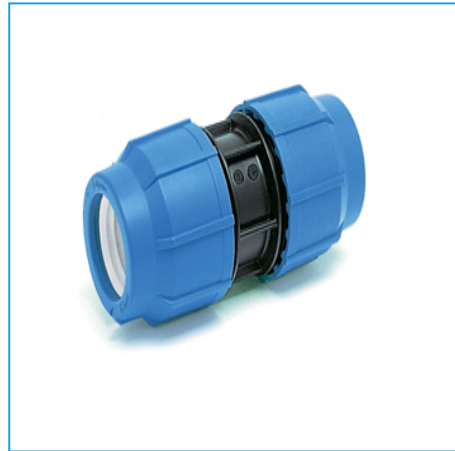
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