INNOVATION
FITTINGS

ALROWAD
INDUSTRIAL COMPLEX

Head Quarter

Industrial Zone B1 Plot No. Xa, Xb 10th Of Ramadan City, Egypt.

+2 055 449 9298/4 - +2 055 449 9290
+2 055 449 9290
Info@alrowadpipe.com

Local Sales

010 13333084/5

International Sales

Neighboring No.9 - Model No.17 - flat No. 1 - Building No. 4
10th of Ramdan city - Egypt
+2 055 43 54 137 - +20 101 21 83 97 20
+2 055 43 54 137
export@alrowadpipes.com

www.Alrowadpipes.com

ALROWAD
INDUSTRIAL COMPLEX

HDPE FITTINGS

INNOVATION FITTINGS

ALROWAD

INDUSTRIAL COMPLEX

INNOVATION FITTINGS

Alrowad company is one of the leading Egyptian companies working in plastic industry specialized in designing and manufacturing HDPE pipes and fitting by using the best raw material and developing the highest technology and quality applied in this field, as It's production capacity reach to 6000 tons per month.

ALROWAD
INDUSTRIAL COMPLEX

HDPE FITTINGS

Alrowad company is specialized in manufacturing HDPE pipes from 32mm till 1200mm diameter with different pressure classes, It also offering welding and complementary items for polyethylene networks and supplies its machines and also train on its usage.

OUR COMPANY

also develops our products from pipes and Fitting to serve many sectors such as potable water networks, sewage water networks, infrastructure projects , natural gas, firefighting lines... etc.

Our vision

to be the leading regional manufacturers of HDPE PIPES and one of the largest manufacturers
As well as contribute in increasing the treatments of potable ,sewage and waste water in Egypt for better living

Our mission

to achieve our vision by providing our customers with Distinctive products ,reliable services ,excellence in quality through complying with both Egyptian and International standards,

CONTENT

We are providing technical support for all stages of the projects

HDPE FITTINGS

- BRASS TRANSITION FITTINGS
- FLANGES
- ELECTROFUSION COUPLER
- FABRICATED ELBOW
- FABRICATED EQUAL TEE
- INJECTION CROSS TEE
- INJECTION 45 DEGREE ELBOW
- INJECTION 90 DEGREE ELBOW
- INJECTION CAP
- INJECTION EQUAL TEE
- INJECTION FLANGE ADAPTER
- INJECTION REDUCED TEE
- EF SADDLES 1200
- EF SADDLES 225-800

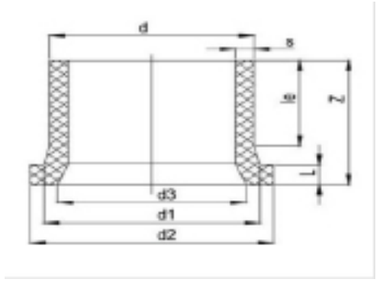


TABLE 1						
Description	d-Size (mm)	d1 (mm)	d2 (mm)	L (mm)	L1 (mm)	weight (kg)
PE 100 SDR11 LONG-63MM	63	75	102	15	65	0.17
PE 100 SDR11 LONG-75MM	75	89	122	17	84	0.28
PE 100 SDR11 LONG-90MM	90	105	138	15	80	0.38
PE 100 SDR11 LONG-110MM	110	122	158	18	100	0.59
PE 100 SDR11 LONG-125MM	125	132	158	22	100	0.81
PE 100 SDR11 LONG-140MM	140	155	188	27	95	1.00
PE 100 SDR11 LONG-160MM	160	175	212	25	110	1.41
PE 100 SDR11 LONG-180MM	180	185	268	30	110	1.71
PE 100 SDR11 LONG-200MM	200	232	268	30	125	2.65
PE 100 SDR11 LONG-225MM	225	235	320	30	110	2.90
PE 100 SDR11 LONG-250MM	250	285	320	30	135	4.37
PE 100 SDR11 LONG-280MM	280	291	370	35	140	4.67
PE 100 SDR11 LONG-315MM	315	355	430	35	155	6.24

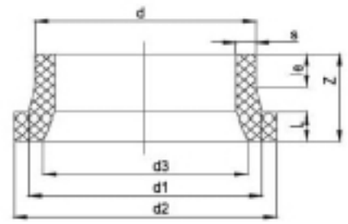


TABLE 2									
Description	D	D1	D2	D3	LE	L	Z	S	Weight
PE100 SDR11 SHORT-225MM	225	238	268	208	50	32.00	120	20.5	1.94
PE100 SDR11 SHORT-250MM	250	288	320	260	45	35.00	120	22.7	2.59
PE100 SDR11 SHORT-315MM	315	338	375	305	57	25.00	120	18.7	2.67
PE100 SDR11 SHORT-355MM	355	379	435	345	45	45.00	120	32.3	5.19
PE100 SDR11 SHORT-400MM	400	430	485	396	45	50.00	124	36.4	6.61
PE100 SDR11 SHORT-450MM	450	465	545	442	40	45.00	134	26.7	7.15
PE100 SDR11 SHORT-500MM	500	530	590	497	45	46.00	120	29.7	7.39
PE100 SDR11 SHORT-560MM	560	618	590	580	36	50.00	130	33.2	10.99
PE100 SDR11 SHORT-630MM	630	645	690	585	45	50.00	120	37.4	10.39
PE100 SDR11 SHORT-710MM	710	740	800	670	40	50.00	130	42.1	15.30
PE100 SDR11 SHORT-800MM	800	843	905	780	45	60.00	140	47.4	20.04
PE100 SDR11 SHORT-900MM	900	947	1005	884	45	60.00	150	53.3	25.04
PE100 SDR11 SHORT-1000MM	1000	1050	1112	972	45	65.00	165	59.3	34.37
PE100 SDR11 SHORT-1200MM	1200	1240	1320	1167	31	75.00	172	71.2	60.76

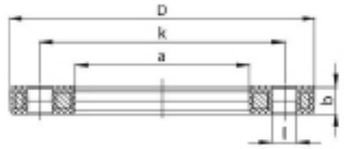


TABLE 3								
Description	d	DN	D2	a	k	b	l	Weight
PE100 SDR11-50MM	50	40	150	62	110	18	18	0.88
PE100 SDR11-63MM	63	50	165	78	125	18	18	1.05
PE100 SDR11-75MM	75	65	188	92	145	18	18	1.34
PE100 SDR11-90MM	90	80	204	108	160	20	18	1.49
PE100 SDR11-110MM	110	100	224	128	180	20	18	1.92
PE100 SDR11-125MM	125	100	224	135	180	20	18	1.90
PE100 SDR11-160MM	160	150	285	178	240	24	22	3.50
PE100 SDR11-180MM	180	150	285	188	240	24	22	3.23
PE100 SDR11-200MM	200	200	340	235	295	27	22	4.93
PE100 SDR11-225MM	225	200	340	238	295	27	22	4.80
PE100 SDR11-250MM	250	250	419	288	355	32	26	9.98
PE100 SDR11-280MM	280	250	419	294	355	32	26	9.66
PE100 SDR11-315MM	315	300	478	338	410	34	26	12.89

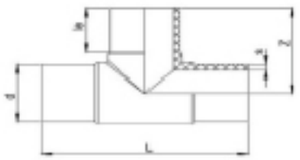


TABLE 4					
Description	d	L	L1	Z	Weight
PE100 SDR11-20MM	20	225	65	115	0.32
PE100 SDR11-25MM	25	260	70	130	0.53
PE100 SDR11-32MM	32	270	80	135	0.76
PE100 SDR11-40MM	40	300	80	150	1.28
PE100 SDR11-50MM	50	230	57	114	0.23
PE100 SDR11-63MM	63	230	65	115	0.36
PE100 SDR11-75MM	75	264	72	132	0.54
PE100 SDR11-90MM	90	301	81	150	0.88
PE100 SDR11-110MM	110	330	68	165	1.45
PE100 SDR11-125MM	125	366	93	183	2.16
PE100 SDR11-140MM	140	380	97	190	2.96
PE100 SDR11-160MM	160	420	103	210	3.81
PE100 SDR11-180MM	180	460	110	230	5.65
PE100 SDR11-200MM	200	500	117	250	7.31
PE100 SDR11-225MM	225	540	125	270	10.49
PE100 SDR11-250MM	250	620	135	312	13.76
PE100 SDR11-280MM	280	690	145	346	21.44
PE100 SDR11-315MM	315	748	155	378	28.19

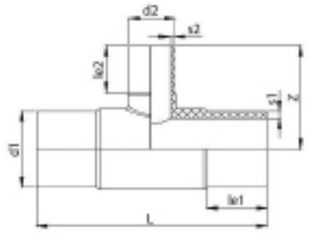


TABLE 5

Description	d/d1	L	L1	Z	I	Weight
PE100 SDR11 -110X63MM	110X63	250	60	130	80	0.88
PE100 SDR11 -110X75MM	110X75	315	70	140	80	1.12
PE100 SDR11 -160X63MM	160X63	320	65	170	110	2.27
PE100 SDR11 -160X90MM	160X90	320	70	165	100	2.31
PE100 SDR11 -160X110MM	160X110	320	85	190	100	2.47

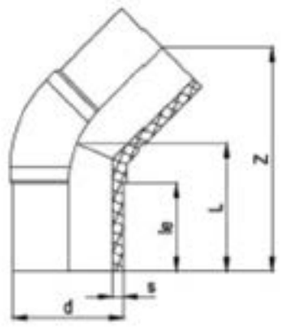


TABLE 6

Description	d	L	Z	Weight
PE100 SDR11-20MM	20	36	42	0.01
PE100 SDR11-25MM	25	40	50	0.02
PE100 SDR11-32MM	32	55	80	0.14
PE100 SDR11-40MM	40	55	85	0.08
PE100 SDR11-50MM	50	60	95	0.12
PE100 SDR11-63MM	63	65	90	0.21
PE100 SDR11-75MM	75	70	100	0.30
PE100 SDR11-90MM	90	80	120	0.53
PE100 SDR11-110MM	110	85	125	0.81
PE100 SDR11-125MM	125	90	135	1.18
PE100 SDR11-140MM	140	100	130	1.40
PE100 SDR11-160MM	160	100	160	2.14
PE100 SDR11-180MM	180	110	165	2.91
PE100 SDR11-200MM	200	115	180	3.76
PE100 SDR11-225MM	225	120	185	5.24
PE100 SDR11-250MM	250	130	210	6.98
PE100 SDR11-280MM	280	135	220	9.57
PE100 SDR11-315MM	315	145	240	12.33

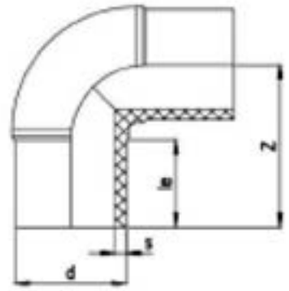


TABLE 7

Description	d	L	Z	Weight
PE100 SDR11-20MM	20	50	75	0.02
PE100 SDR11-25MM	25	50	81	0.03
PE100 SDR11-32MM	32	54	86	0.05
PE100 SDR11-40MM	40	57	91	0.08
PE100 SDR11-50MM	50	60	103	0.15
PE100 SDR11-63MM	63	63	113	0.24
PE100 SDR11-75MM	75	70	130	0.37
PE100 SDR11-90MM	90	82	145	0.64
PE100 SDR11-110MM	110	85	160	1.01
PE100 SDR11-125MM	125	90	175	1.45
PE100 SDR11-140MM	140	115	195	1.96
PE100 SDR11-160MM	160	103	200	2.70
PE100 SDR11-180MM	180	105	226	3.82
PE100 SDR11-200MM	200	115	245	5.22
PE100 SDR11-225MM	225	120	260	6.64
PE100 SDR11-250MM	250	130	275	8.98
PE100 SDR11-280MM	280	135	300	12.07
PE100 SDR11-315MM	315	150	350	17.89

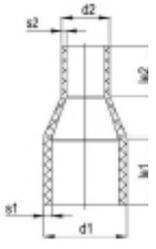


TABLE 8

Description	d	L	L1	Z	Weight
PE100 SDR11 LONG -90X63MM	90X63	80	55	180	0.30
PE100 SDR11 LONG -110X90MM	11X90	90	85	190	0.52
PE100 SDR11 LONG -125X90MM	125X90	90	80	210	0.63
PE100 SDR11 LONG -125X110MM	125X110	80	85	210	0.73
PE100 SDR11 LONG -160X90MM	160X90	95	75	220	1.05
PE100 SDR11 LONG -160X110MM	160X110	95	75	220	1.12
PE100 SDR11 LONG -160X125MM	160X125	95	85	220	1.17
PE100 SDR11 LONG -200X110MM	200X110	115	85	265	1.89
PE100 SDR11 LONG -200X160MM	200X160	120	90	255	2.20
PE100 SDR11 LONG -200X125MM	200X125	115	85	265	1.89
PE100 SDR11 LONG -225X125MM	255X125	125	85	280	1.76
PE100 SDR11 LONG -225X160MM	255X160	125	100	275	2.73
PE100 SDR11 LONG -250X160MM	250X160	110	100	300	3.48

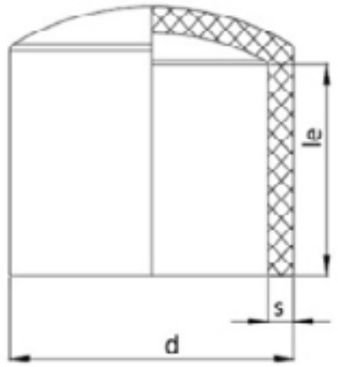
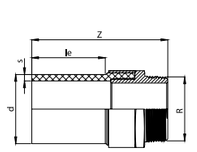
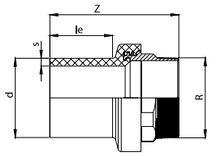


TABLE 9

Description	d	L	Z	Weight
PE100 SDR11-20MM	20	40	45	0.01
PE100 SDR11-25MM	25	45	50	0.01
PE100 SDR11-32MM	32	50	55	0.02
PE100 SDR11-40MM	40	50	60	0.02
PE100 SDR11-50MM	50	60	65	0.04
PE100 SDR11-63MM	63	65	70	0.07
PE100 SDR11-75MM	75	70	80	0.13
PE100 SDR11-90MM	90	75	85	0.20
PE100 SDR11-110MM	110	85	95	0.33
PE100 SDR11-125MM	125	90	105	0.54
PE100 SDR11-140MM	140	90	105	0.62
PE100 SDR11-160MM	160	100	115	0.82
PE100 SDR11-180MM	180	105	125	1.20
PE100 SDR11-200MM	200	110	125	1.58
PE100 SDR11-255MM	225	120	140	2.11
PE100 SDR11-250MM	250	125	165	2.82
PE100 SDR11-280MM	280	132	185	3.97
PE100 SDR11-315MM	315	145	200	5.64



d: 20-63mm



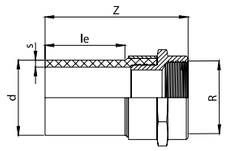
d: 75-125mm

TRANSITION ADAPTOR
PE-BRASS (MS58)
MALE THREAD PE100 SDR11

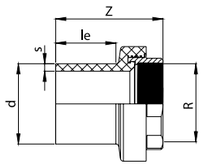
Injected
Long spigot
***Just for water**

16 Bar Water
10 Bar Gas

dR		Article No	leZs			Weight
mminch			mmmmmm			kg
20	½”	**001 117 6205 0020**	41	**76**	3,0	**0,060**
25	¾”	**001 117 6205 0025**	41	**79**	3,0	**0,100**
32	¾”	**001 117 6205 3201**	44	**83**	3,0	**0,130**
32	1”	**001 117 6205 0032**	44	**86**	3,0	**0,140**
40	1¼”	**001 117 6205 0040**	49	**101**	3,7	**0,255**
50	1½”	**001 117 6205 0050**	55	**112**	4,6	**0,370**
63	2”	**001 117 6205 0063**	63	**125**	5,8	**0,560**
***75**	2½”	**001 117 6200 0075**	70	**146**	6,8	**0,980**
***90**	3”	**001 117 6200 0090**	79	**168**	8,2	**1,410**
***110**	4”	**001 117 6200 0110**	82	**179**	10,0	**2,080**
***125**	4”	**001 117 6200 0125**	87	**186**	11,4	**2,230**



d: 20-63mm



d: 75-125mm

TRANSITION ADAPTOR
PE-BRASS (MS58)
FEMALE THREAD PE100 SDR11

Injected
Long spigot
***Just for water**

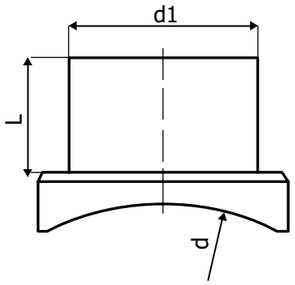
16 Bar Water
10 Bar Gas

dR		Article No	leZs			Weight
mminch			mmmmmm			kg
20	½”	**001 117 6206 0020**	41	**75**	3,0	**0,065**
25	¾”	**001 117 6206 0025**	41	**78**	3,0	**0,095**
32	1”	**001 117 6206 0032**	44	**85**	3,0	**0,145**
40	1¼”	**001 117 6206 0040**	49	**100**	3,7	**0,270**
50	1½”	**001 117 6206 0050**	55	**111**	4,6	**0,375**
63	2”	**001 117 6206 0063**	63	**124**	5,8	**0,550**
***75**	2½”	**001 117 6201 0075**	70	**129**	6,8	**0,825**
***90**	3”	**001 117 6201 0090**	79	**144**	8,2	**1,130**
***110**	4”	**001 117 6201 0110**	82	**147**	10,0	**1,690**
***125**	4”	**001 117 6201 0125**	87	**153**	11,4	**1,760**

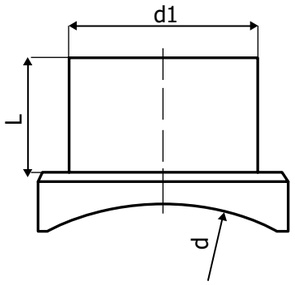
DIFFUSERS

Wherever your project is our solution will fit

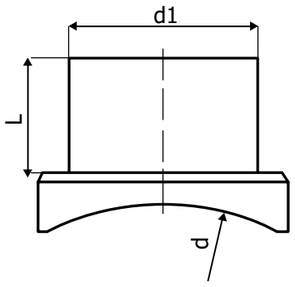
- Outfalls usually terminate in one or more diffuser sections.
- Diffusers can be of different designs such as a “Y” or “T” outlet, a pipe length in which holes have been drilled on top of the pipe within 10 and 2 o’clock, or a pipe length onto which vertical risers consisting of short sections of smaller diameter PE pipe have been fused.
- Diffusers are often designed for connection to the pipe by means of flange assemblies.
- The connection can be made prior to launching, or by divers after the pipeline has been submerged.
- When a diffuser is attached prior to launching, it is necessary to float the diffuser higher up over the water by means of some additional buoyancy.
- This is necessary to prevent water from entering the pipe through the diffuser openings.
- This additional buoyancy is released as the pipe is sunk into position.
- Extreme care should be taken in the submersion of a marine line with an engineered diffuser attached to the pipeline which is being sunk in place.
- The sinking process can create considerable stresses on the fittings that may be inherent to the de- sign of the diffuser itself such as flanges, tees and/or other mechanical connections.



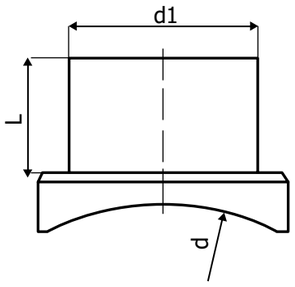
dDs	Description	(NJ)	Weight
250-75	PN10-PN16	120	1,900
250-90	PN10-PN16	120	1,950
250-110	PN10-PN16	120	1,850
250-125	PN10-PN16	120	1,950
250-140	PN10-PN16	150	5,100
250-160	PN10-PN16	135	4,400
250-180	PN10-PN16	160	4,900
250-200	PN10-PN16	150	3,100
250-225	PN10-PN16	170	4,200
280-75	PN10-PN16	120	2,000
280-90	PN10-PN16	120	2,075
280-110	PN10-PN16	120	1,950
280-125	PN10-PN16	120	1,980
280-140	PN10-PN16	150	5,200
280-160	PN10-PN16	135	4,500
280-180	PN10-PN16	160	5,150
280-200	PN10-PN16	150	3,250
280-225	PN10-PN16	170	4,350
315-75	PN10-PN16	120	2,075
315-90	PN10-PN16	120	2,100
315-110	PN10-PN16	120	1,925
315-125	PN10-PN16	120	2,000
315-140	PN10-PN16	150	5,250
315-160	PN10-PN16	135	4,600
315-180	PN10-PN16	160	5,200
315-200	PN10-PN16	150	3,400
315-225	PN10-PN16	170	4,590
*315-250	PN10-PN16	***	***
355-75	PN10-PN16	120	2,375
355-90	PN10-PN16	120	2,460
355-110	PN10-PN16	120	2,200
355-125	PN10-PN16	120	2,100
355-140	PN10-PN16	150	5,600
355-160	PN10-PN16	135	4,800
355-180	PN10-PN16	160	5,450
355-200	PN10-PN16	150	3,650
355-225	PN10-PN16	170	4,430
*355-250	PN10-PN16	***	***



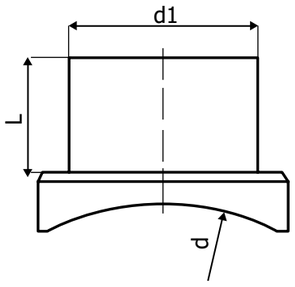
dDs	Description	pp	Weight
400-75	PN 10-PN 16	120	2,300
400-90	PN 10-PN 16	120	2,400
400-110	PN 10-PN 16	120	1,850
400-125	PN 10-PN 16	120	2,150
400-140	PN 10-PN 16	150	6,200
400-160	PN 10-PN 16	135	5,050
400-180	PN 10-PN 16	160	5,700
400-200	PN 10-PN 16	150	3,825
400-225	PN 10-PN 16	170	4,520
*400-250	PN 10-PN 16	***	***
*400-280	PN 10-PN 16	***	***
*400-315	PN 10-PN 16	***	***
*400-355	PN 10-PN 16	***	***
450-63	PN 10-PN 16	125	2,350
450-75	PN 10-PN 16	120	2,375
450-90	PN 10-PN 16	120	2,450
450-110	PN 10-PN 16	120	1,900
450-125	PN 10-PN 16	120	2,150
450-140	PN 10-PN 16	150	5,350
450-160	PN 10-PN 16	135	4,635
450-180	PN 10-PN 16	160	5,700
450-200	PN 10-PN 16	150	3,950
450-225	PN 10-PN 16	170	4,600
*450-250	PN 10-PN 16	***	***
*450-280	PN 10-PN 16	***	***
*450-315	PN 10-PN 16	***	***
*450-355	PN 10-PN 16	***	***



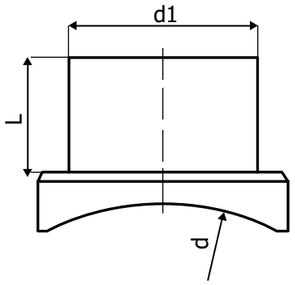
dDs	Description	(NJ)	Weight
500-63	PN 10-PN 16	125	2,350
500-75	PN 10-PN 16	120	2,375
500-90	PN 10-PN 16	120	2,450
500-110	PN 10-PN 16	120	1,925
500-125	PN 10-PN 16	120	2,150
500-140	PN 10-PN 16	150	5,350
500-160	PN 10-PN 16	135	4,690
500-180	PN 10-PN 16	160	5,900
500-200	PN 10-PN 16	150	4,025
500-225	PN 10-PN 16	170	4,650
*500-250	PN 10-PN 16	***	***
*500-280	PN 10-PN 16	***	***
*500-315	PN 10-PN 16	***	***
*500-355	PN 10-PN 16	***	***
*500-400	PN 10-PN 16	***	***
*500-450	PN 10-PN 16	***	***
560-63	PN 10-PN 16	125	2,400
560-75	PN 10-PN 16	120	2,350
560-90	PN 10-PN 16	120	2,400
560-110	PN 10-PN 16	120	2,025
560-125	PN 10-PN 16	120	2,200
560-140	PN 10-PN 16	150	5,750
560-160	PN 10-PN 16	135	4,890
560-180	PN 10-PN 16	160	5,900
560-200	PN 10-PN 16	150	4,600
560-225	PN 10-PN 16	170	4,800
*560-250	PN 10-PN 16	***	***
*560-280	PN 10-PN 16	***	***
*560-315	PN 10-PN 16	***	***
*560-355	PN 10-PN 16	***	***
*560-400	PN 10-PN 16	***	***
*560-450	PN 10-PN 16	***	***



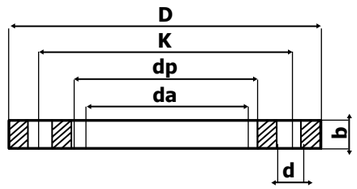
dDs	Description	(NJ)	Weight
630-63	PN 10-PN 16	125	2,400
630-75	PN 10-PN 16	120	2,600
630-90	PN 10-PN 16	120	2,650
630-110	PN 10-PN 16	120	2,150
630-125	PN 10-PN 16	120	2,200
630-140	PN 10-PN 16	150	5,800
630-160	PN 10-PN 16	135	4,950
630-180	PN 10-PN 16	160	6,000
630-200	PN 10-PN 16	150	4,700
630-225	PN 10-PN 16	170	4,900
*630-250	PN 10-PN 16	***	***
*630-280	PN 10-PN 16	***	***
*630-315	PN 10-PN 16	***	***
*630-355	PN 10-PN 16	***	***
*630-400	PN 10-PN 16	***	***
*630-450	PN 10-PN 16	***	***
*630-500	PN 10-PN 16	***	***
*630-560	PN 10-PN 16	***	***
710-63	PN 10-PN 16	125	2,400
710-75	PN 10-PN 16	120	2,250
710-90	PN 10-PN 16	120	2,300
710-110	PN 10-PN 16	120	1,650
710-125	PN 10-PN 16	120	2,250
710-140	PN 10-PN 16	150	5,800
710-160	PN 10-PN 16	135	4,950
710-180	PN 10-PN 16	160	5,800
710-200	PN 10-PN 16	150	3,930
710-225	PN 10-PN 16	170	4,950
*710-250	PN 10-PN 16	***	***
*710-280	PN 10-PN 16	***	***
*710-315	PN 10-PN 16	***	***
*710-355	PN 10-PN 16	***	***
*710-400	PN 10-PN 16	***	***
*710-450	PN 10-PN 16	***	***
*710-500	PN 10-PN 16	***	***
*710-560	PN 10-PN 16	***	***



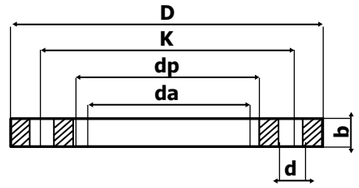
dDs	Description	(NJ)	Weight
800-63	PN 10-PN 16	125	2,400
800-75	PN 10-PN 16	120	2,200
800-90	PN 10-PN 16	120	2,300
800-110	PN 10-PN 16	120	1,700
800-125	PN 10-PN 16	125	2,200
800-140	PN 10-PN 16	150	5,800
800-160	PN 10-PN 16	135	4,950
800-180	PN 10-PN 16	160	5,700
800-200	PN 10-PN 16	150	3,900
800-225	PN 10-PN 16	170	4,950
*800-250	PN 10-PN 16	***	***
*800-280	PN 10-PN 16	***	***
*800-315	PN 10-PN 16	***	***
*800-355	PN 10-PN 16	***	***
*800-400	PN 10-PN 16	***	***
*800-450	PN 10-PN 16	***	***
*800-500	PN 10-PN 16	***	***
*800-560	PN 10-PN 16	***	***
*800-630	PN 10-PN 16	***	***
900-63	PN 10-PN 16	125	2,250
900-75	PN 10-PN 16	120	2,200
900-90	PN 10-PN 16	120	2,300
900-110	PN 10-PN 16	120	1,700
900-125	PN 10-PN 16	120	2,150
900-140	PN 10-PN 16	150	5,800
900-160	PN 10-PN 16	135	4,950
900-180	PN 10-PN 16	160	5,700
900-200	PN 10-PN 16	150	3,900
900-225	PN 10-PN 16	170	4,950
*900-250	PN 10-PN 16	***	***
*900-280	PN 10-PN 16	***	***
*900-315	PN 10-PN 16	***	***
*900-355	PN 10-PN 16	***	***
*900-400	PN 10-PN 16	***	***
*900-450	PN 10-PN 16	***	***
*900-500	PN 10-PN 16	***	***
*900-560	PN 10-PN 16	***	***
*900-630	PN 10-PN 16	***	***



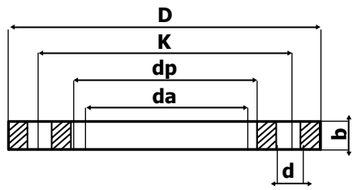
dDs	Description	Weight
1000-63	PN 10-PN 16	125 2,250
1000-75	PN 10-PN 16	120 2,200
1000-90	PN 10-PN 16	120 2,300
1000-110	PN 10-PN 16	120 1,700
1000-125	PN 10-PN 16	120 2,150
1000-140	PN 10-PN 16	150 5,800
1000-160	PN 10-PN 16	135 4,950
1000-180	PN 10-PN 16	160 5,700
1000-200	PN 10-PN 16	150 3,900
1000-225	PN 10-PN 16	170 4,950
*1000-250	PN 10-PN 16	*** ***
*1000-280	PN 10-PN 16	*** ***
*1000-315	PN 10-PN 16	*** ***
*1000-355	PN 10-PN 16	*** ***
*1000-400	PN 10-PN 16	*** ***
*1000-450	PN 10-PN 16	*** ***
*1000-500	PN 10-PN 16	*** ***
*1000-560	PN 10-PN 16	*** ***
*1000-630	PN 10-PN 16	*** ***



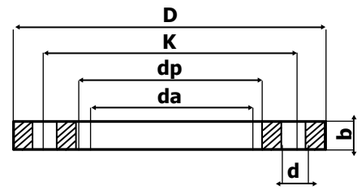
DN	da(mm)	dp(mm)	K(mm)	D(mm)	d(mm)	b(mm)
200	200	235	295	340	22	24
200	225	238	295	340	22	24
250	250	288	350	395	22	26
250	280	294	350	395	22	26
300	315	338	400	445	22	26
350	355	376	460	505	22	26
400	400	430	515	565	26	26
450	450	465	565	615	26	28
500	500	533	620	670	26	28
600	560	618	725	780	30	28
600	630	645	725	780	30	28
700	710	740	840	895	30	30
800	800	843	950	1015	33	32
900	900	947	1050	1115	33	34
1000	1000	1050	1160	1230	36	34
1200	1200	1250	1380	1455	39	38
1400	1400	1460	1590	1675	42	42
1600	1600	1650	1820	1915	48	46



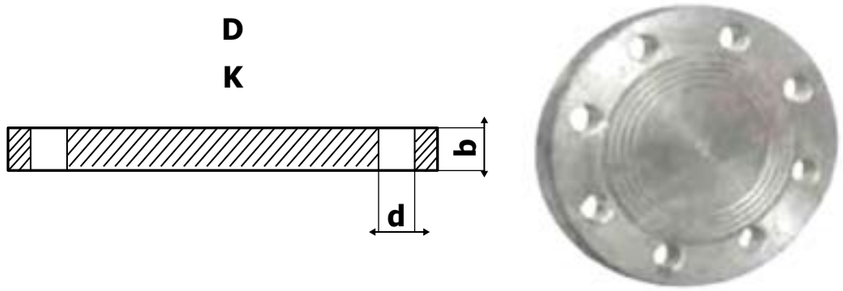
DN	da(mm)	dp(mm)	K(mm)	D(mm)	d(mm)	b(mm)
15	20	28	65	95	14	14
20	25	34	75	105	14	16
25	32	42	85	115	14	16
32	40	51	100	140	18	16
40	50	62	110	150	18	16
50	63	78	125	165	18	18
65	75	92	145	185	18	18
80	90	108	160	200	18	20
100	110	125	180	220	18	20
100	125	135	180	220	18	20
125	140	158	210	250	18	22
150	160	178	240	285	22	22
150	180	188	240	285	22	22
200	200	235	295	340	22	24
200	225	238	295	340	22	24
250	250	288	355	405	26	26
250	280	294	355	405	26	26
300	315	338	410	460	26	28
350	355	376	470	520	26	30
400	400	430	525	580	30	32
450	450	465	585	640	30	34
500	500	533	650	715	33	34
600	560	618	770	840	36	36
600	630	645	770	840	36	36
700	710	740	840	910	36	36
800	800	843	950	1025	39	38
900	900	947	1050	1125	39	40
1000	1000	1050	1170	1255	42	42
1200	1200	1250	1390	1485	48	48
1400	1400	1460	1590	1685	48	52
1600	1600	1650	1820	1930	55	58



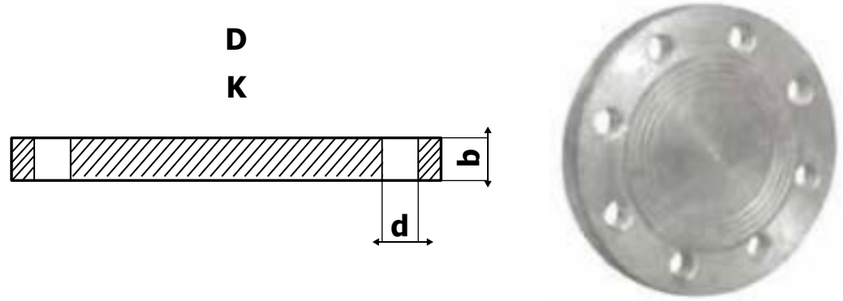
DN	da(mm)	dp(mm)	K(mm)	D(mm)	d(mm)	b(mm)
200	200	235	295	340	22	26
200	225	235	295	340	22	26
250	250	288	350	395	22	29
250	280	294	350	395	22	29
300	315	338	400	445	22	29
350	355	376	460	514	22	38
400	400	430	515	571	26	40
450	450	465	565	615	26	40
500	500	533	620	670	26	40
600	560	618	725	788	30	43
600	630	645	725	788	30	43



DN	da(mm)	dp(mm)	K(mm)	D(mm)	d(mm)	b(mm)
(*)15	20	29	65	95	14	15
(*)20	25	34	75	102	14	15
25	32	42	85	115	14	16
32	40	51	100	140	18	16
40	50	62	110	150	18	16
50	63	78	125	165	18	18
65	75	92	145	185	18	18
80	90	108	160	200	18	20
100	110	125	180	220	18	20
100	125	135	180	220	18	20
125	140	158	210	250	18	22
150	160	178	240	285	22	22
150	180	188	240	285	22	22
200	200	235	295	340	22	26
200	225	235	295	340	22	26
250	250	288	355	405	26	29
250	280	294	355	405	26	29
300	315	338	410	460	26	31
350	355	376	470	532	26	40
400	400	430	525	592	30	43
450	450	465	585	640	30	45
500	500	533	650	715	33	45
600	560	618	770	840	36	48
600	630	645	770	840	36	48



DN	da(mm)	K(mm)	D(mm)	b(mm)	d(mm)
200	200	295	340	24	22
200	225	295	340	24	22
250	250	350	395	26	22
250	280	350	395	26	22
300	315	400	445	26	22
350	355	460	505	26	22
400	400	515	565	26	26
450	450	565	615	28	26
500	500	620	670	28	26
600	560	725	780	28	30
600	630	725	780	28	30
700	710	840	895	30	30
800	800	950	1015	32	33
900	900	1050	1115	34	33
1000	1000	1150	1230	34	36
1200	1200	1380	1455	38	39
1400	1400	1590	1675	42	42
1600	1600	1820	1915	46	48



DN	da(mm)	K(mm)	D(mm)	b(mm)	d(mm)
15	20	65	95	14	14
20	25	75	105	16	14
25	32	85	115	16	14
32	40	100	140	16	18
40	50	110	150	16	18
50	63	125	165	18	18
65	75	145	185	18	18
80	90	160	200	20	18
100	110	180	220	20	18
100	125	180	220	20	18
125	140	210	250	22	18
150	160	240	285	22	22
150	180	240	285	22	22
200	200	295	340	24	22
200	225	295	340	24	22
250	250	355	405	26	26
250	280	355	405	26	26
300	315	410	460	28	26
350	355	470	520	30	26
400	400	525	580	32	30
450	450	585	640	34	30
500	500	650	715	34	33
600	560	770	840	36	36
600	630	770	840	36	36
700	710	840	910	36	36
800	800	950	1025	38	39
900	900	1050	1125	40	39
1000	1000	1170	1255	42	42
1200	1200	1390	1485	48	48
1400	1400	1590	1685	52	48
1600	1600	1820	1930	58	55

APPLICATION AND INSTALLATION HDPE PIPES

APPLICATION AND INSTALLATION HDPE PIPES

PREPARATION OF TRENCH BOTTOM:

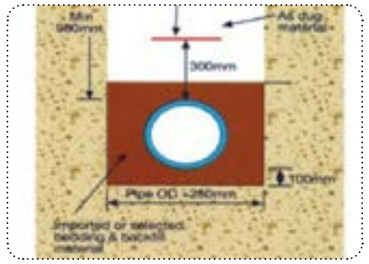
- The trench bottom should be
constructed to prove a firm, stable and uniform support from the full length of the pipe
- When an unstable sub-grade condition is encountered which will provide inadequate pipe support, additional trench depth should be excavated and refilled with suitable foundation materials as specified by the engineer
- The ground water level in the trench should be kept below the pipe

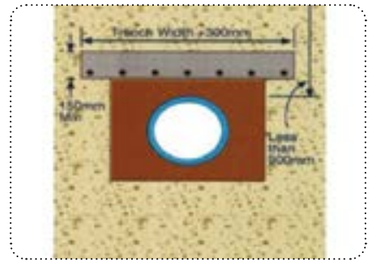
BEDDING:

Bedding is required primarily to bring the trench bottom up to grade.
- Bedding materials should be placed to provide a uniform and adequate longitudinal support under the pipe.
- A compacted depth of 4 to 6 inches (100-150mm) is generally sufficient bedding thickness.
- Bedding material should be free of ridges, hollows and lumps.
- The trench bottom should be smooth and free of rocks.
- Bedding should consist of free flowing material such as gravel, sand, salty sand or clayey sand that is free of stones or hard practices larger than 1 1\2 inch.

HAUNCHING:

The most important factor affecting the pipe performance and deflection is the haunching material and its density
- Material should be placed and consolidated under the pipe haunch to provide adequate side support to the pipe while avoiding both vertical and lateral displacement of the pipe from proper alignment.
- Where coarse material with voids has been used for bedding, the same coarse material should also be used for haunching and consideration should be given to native soil migration.
- Haunching is placed up to the pipe spring line.





INITIAL BACKFILL:

Initial backfill is that portion of the pipe embedment beginning at the spring line of extending some distance over the pipe and the top of the pipe.
- Since no additional side support is gained above the spring line, native soil may be used without special compaction efforts.
- The sole purpose of somewhat careful placement of these native trench materials is to protect the pipe from the dropping of large rocks or other impact loads that may occur during final backfill
- Minimum cover is recommended to be 6 inch (150mm)

FINAL BACKFILL:

The material used in the final backfilling operation need not to be as carefully selected as the bedding, haunching and the initial backfill material, exclude boulders, frozen clumps of dirt, and rubble which could damage the pipe.

QUALITY ASSURANCE AND FIELD TESTING:

LEAK TESTING - CONSIDERATIONS FOR ALL PROCEDURES

The intent of leak testing is to find unacceptable joint leakage in pressure piping systems. If leaks exist, they may manifest themselves by leakage or rupture. Leak tests of pressure systems generally involve filling the system or a section of the system with a liquid or gaseous fluid and applying internal pressure to determine resistance to leakage.

Safety is of paramount importance when conducting pressurized internal fluid leak tests. Although routinely performed, leak tests may be the very first time a newly installed system or repair will be subjected to stress.

- Even at relatively low internal pressures, leak testing with a pressurized internal fluid can generate very high forces that can be dangerous or even fatal if suddenly released by the failure of a joint or system component or a testing component.
- Always take safety precautions when conducting pressurized fluid leak tests.
- Restrain pipe, components and test equipment against movement in the event of failure. Joints may be exposed for leakage inspection provided that restraint is maintained.
- Keep persons not involved in testing a safe distance away while testing is being conducted.
- Liquids such as water are preferred as test fluids because less energy is released if something in the test section fails catastrophically. During a pressure leak test, energy (internal pressure) is applied to stress the test section. If the test fluid is an incompressible liquid such as water, the energy applied to pressurize the liquid transfers primarily to the pipe and components in the test section. However, if the test fluid is a compressible gas, energy is applied to compress the gas as well as to stress the piping section. If a catastrophic failure occurs during a pressurized liquid leak test, the overall applied energy is much lower and energy dissipation is rapid.
- However, if catastrophic failure occurs during a pressurized gas test, energy release is many times greater, much more forceful and longer duration.
- Where hydrostatic testing is specified, never substitute compressed gas (pneumatic) for liquid (hydrostatic) testing.
- Maximum leak test pressure is temperature dependent. If possible, test fluid and test section temperatures should be less than 80°F (27°C). At temperatures above 80°F (27°C), reduced test pressure is required. Contact the pipe manufacturer for technical assistance with elevated temperature pressure reduction. Sunlight heating of exposed PE pipe, especially black PE pipe, can result in high pipe temperature.

- Before applying test pressure, allow time for the test fluid and the test section to temperature equalize. Hydrostatic leak tests typically use cooler liquids so the liquid-filled test section will tend to equalize to a lower temperature near test liquid temperature. Compressed gases used in pneumatic leak tests do not have similar temperature lowering eqects, so it is more likely that test pressures will have to be reduced due to elevated temperature eqects when conducting pneumatic leak tests. Bursting can result if test pressure is not reduced for elevated test section temperature.
- Leak Test Pressure and Duration – The maximum allowable leak test pressure and leak test time including initial expansion, and time at leak test pressure should be in accordance with the following equation and Tables 12 and 13.

$$PI_{(T)} = \frac{2 \times HDS \times F_t \times H_T}{(DR-1)}$$

Where:
$P_{(T)}$ = Leak Test Pressure, psig, for Leak Test Time, T (from Table 11)
T = Leak Test Time, hours
HDS = PE material hydrostatic design stress for water at 73°F (23°C), psi
F_t = PE material elevated temperature reduction factor
H_T = Leak test duration factor for leak test time, T
DR = Pipe dimension ratio

Table 12: Leak Test Duration Factor, H_T

Leak Test Pressure $P_{(T)}$ (psig)	Leak Test Time T(hours)	Leak Test Duration Factor H_T
$P_{(8)}$	≤8	1.5
$P_{(48)}$	≤48	1.25
$P_{(120)}$	≤120	1.00

Table 13: PE Material Hydrostatic Design Stress (HDS)

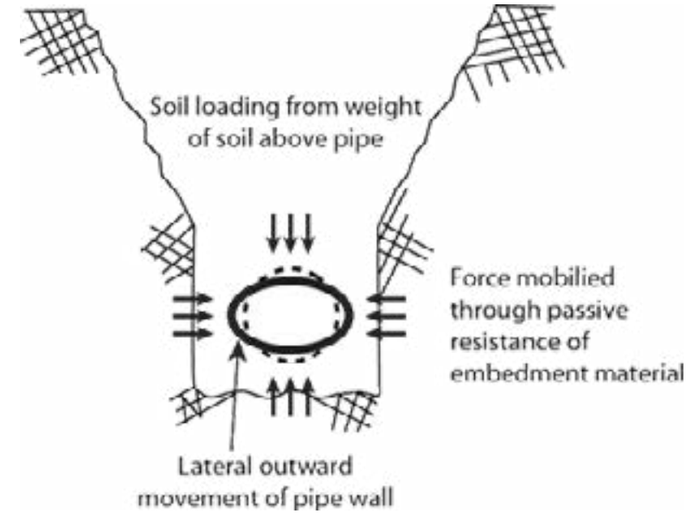
PE Material Designation Code	HDS for Water at 73°F (psi)
PE2708	800
PE3608	800
PE3710	1000
PE4710	1000

ENGINEERED TRENCH SPECIFICATION:

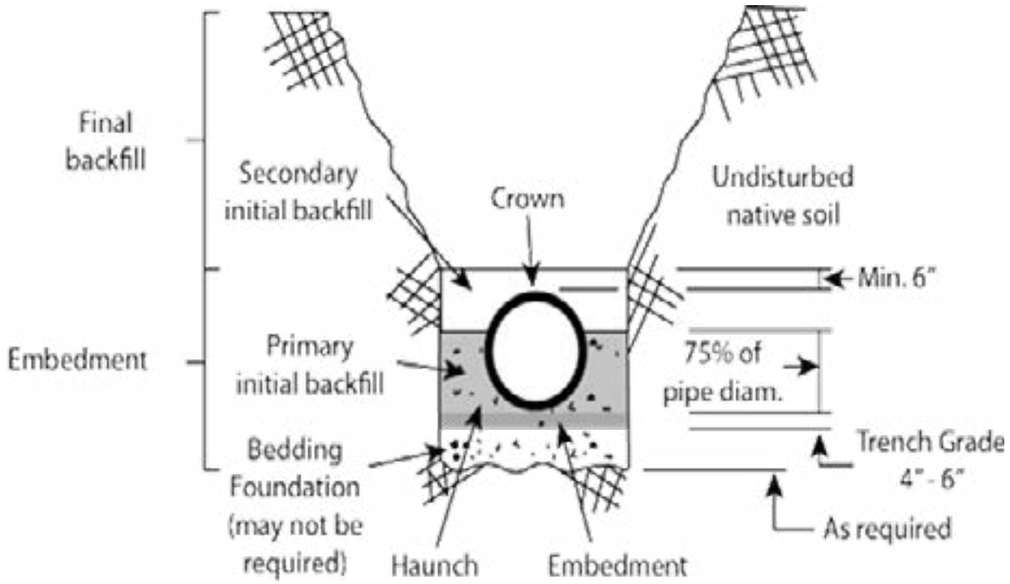
For applications where the simplified installation guidelines do not apply -- such as gravity flow pipes that are relatively deep, shallow cover applications where the pipe is subject to vehicular or train loading, pipes placed in unstable, soft, or wet soils, high DR pipes, or pipes in deep applications such as landfills and embankments -- the engineer must prepare a specific embedment specification. In these cases, detailed attention must be paid to the native soil, the embedment soil, and the placement of the embedment soil. The key objective of installation is to minimize or control subsequent pipe deflection. A limit of 5% is commonly used, which provides an additional safety factor, as most gravity flow PE pipe can withstand higher deflection without damage.

The load carrying capability of a PE pipe, particularly a pipe with a high DR, can be greatly increased by the soil in which it is embedded, including the installation procedure. When the pipe is loaded, load is transferred from the pipe to the soil by a horizontal outward movement of the pipe wall. This enhances contact between pipe and soil and mobilizes the passive resistance of the soil. This resistance aids in preventing further pipe deformation and contributes to the support for the vertical loads.

The factors to be considered in a properly engineered installation specification include pipe embedment materials, compaction of embedment materials, trench dimensions, and trench design and construction. These four items are discussed separately



Mobilization of Enveloping Soil through Pipe Deformation



PE piping is considered “flexible”, indicating such products can withstand large amounts of deflection without damage. However, since their flexibility is directly proportional to the dimension ratio (outer diameter divided by minimum wall thickness), diaerent installation requirements may be necessary for diaerent DR values to achieve successful and economical installations. The depth of cover and anticipated surface loads aaect the particular installation requirements. Therefore, the engineer has to make an assessment of the application and site conditions to determine the best and most economical installation design.

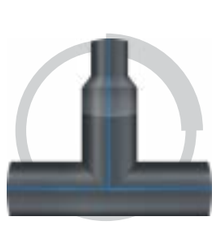
There are two objectives to achieve in an installation. The first is to provide an envelope of embedment to protect the pipe from mechanical damage from impact or hard objects (cobbles, boulders) in the soil. The second is to provide support against earth and live load pressures, where required. The earth and live loads are supported by the combination of the stianess of the pipe and the stianess of the surrounding embedment material. Lower DR pipes will carry more of the load and require less support from the soil in haunch areas. When support from the embedment is needed by the pipe to resist earth and live loads, the embedment material is often compacted. The trench backfill placed on top of the embedment material may also be compacted. Compaction of trench backfill immediately above the pipe facilitates the redistribution of some of the load away from the pipe and into the side-fill soil.

FABRICATED FITTINGS

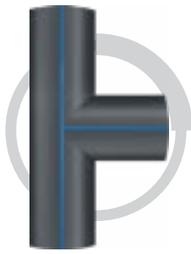
1200-110 mm
Welding procedures

HDPE FITTINGS
WELDING FITTINGS:

Butt welding method used to join two lengths of PE pipes together or join PE pipe with PE fitting This method conform to DVS 2207-1
Polyethylene (PE) pipes for the production of butt fusion joints in accordance with this method shall conform to ISO 4437, ISO4427-2 , DIN8074/8075 or equivalent standards.



Segmented Reduced Tee 90°
From 110mm - 630mm



Segmented Tee 90°
From 90mm - 630mm

Segmented Cross
From 110mm - 630mm

Segmented Tee 90°
From 110mm - 120mm

Segmented Tee 60°
From 110mm - 1200mm

Segmented Tee 45°
From 110mm - 1200mm

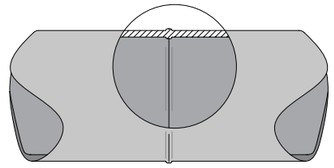
Segmented Tee 30°
From 110mm - 1200mm

HDPE FABRICATED FITTINGS

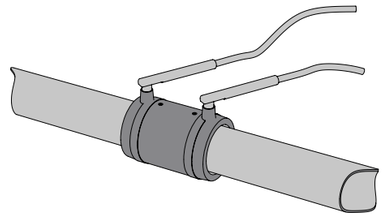
JOINTING :

One of the greatest features of HDPE pipes is the fact that a wide variety of jointing systems is available to suit a whole range of applications. The jointing systems can be divided into permanent jointing and detachable jointing. The schematic below illustrates the available systems.

PERMANENT JOINTING :



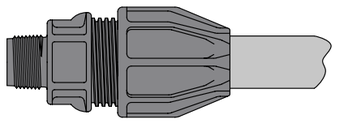
- Buttwelding -



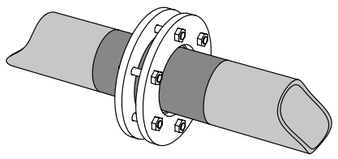
- Electro-fusion -

“Both buttwelding and elec tro-fusion systems allow transition to detachable joints”.

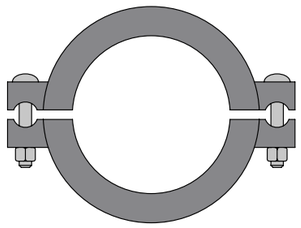
NON-PERMANENT (DETACHABLE) JOINTING :



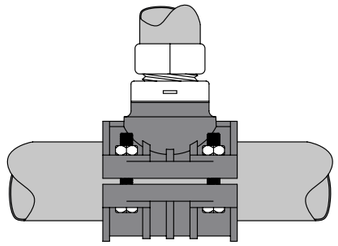
- Compression Fittings* -



- Flanging -



- Tak System -



- Magnum Saddles and Holderbats** -

* : “ Refer to our Marley Astore Compression Fittings document for full details on these products.”
** : “ Refer to our Magnum saddles and Holderbats document for full details on these products. “

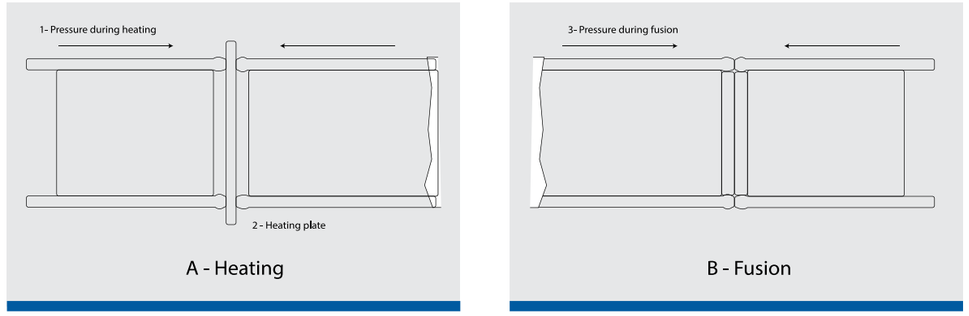
BUTT WELDING :

BUTT FUSION WELDING :

Butt welding method used to join two lengths of PE pipes together or join PE pipe with PE fitting
This method conform to DVS 2207-1
Polyethylene (PE) pipes for the production of butt fusion joints in accordance with this method shall conform to ISO 4437, ISO4427-2 , DIN8074/8075 or equivalent standards.

BUTT FUSION PRINCIPLE :

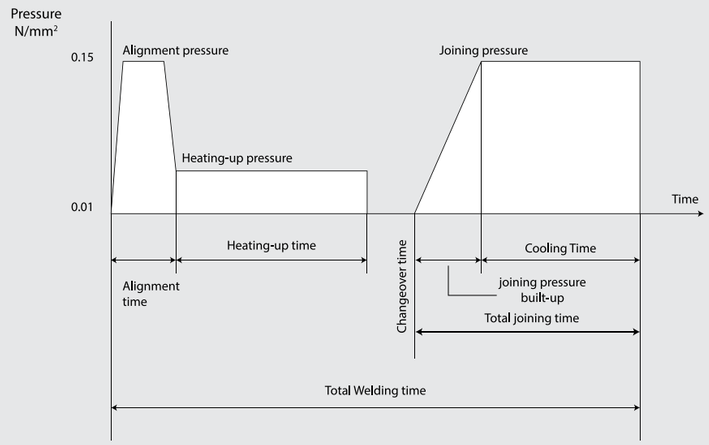
The principle of butt fusion jointing is to heat two pipes or fitting ends by means of a heater plate to a designated temperature, then fuse them together by applying pressure and cool them under pressure for a designated time. Butt fusion joints shall be made by qualified oper- ators using butt fusion jointing ma- chines that secures and precisely align the pipe ends.



Butt Fusion Principles

BUTT FUSION WELDING MACHINE:

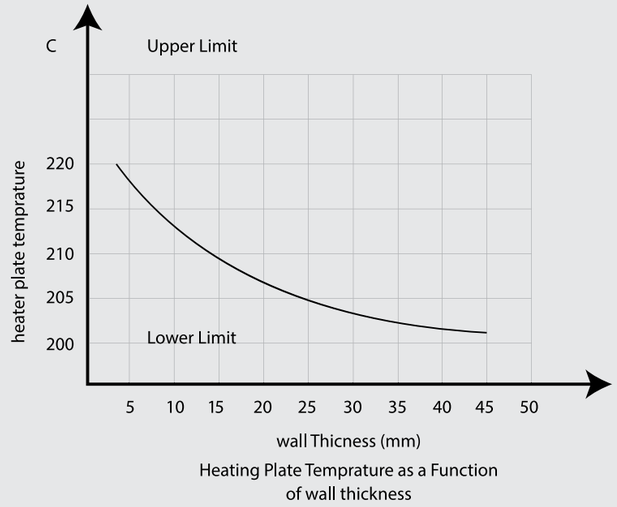
The following conditions should be achieved in a butt welding machine. Aligning the pipe ends. Clamping the pipes. Facing the pipe ends parallel and square to the centerline. Heating the pipe ends. Applying the proper fusion force. Conforming to ISO12176-1, DVS2208-1



Butt Fusion Cycle

BUTT FUSION TEMPERATURE:

The butt fusion temperature is normally situated between 200 c and 220 c



Heating Plate Temprature as a Function of wall thickness

BUTT FUSION JOINTING PROCEDURE:

The following steps should be executed to make perfect butt welding:
- Clean the pipe or fitting ends, planning unit or heater's surfaces
- Clean the inside and the outside of the pipe or fitting to be joined by wiping the joint area with a clean lint-free cloth
- All foreign matter should be removed from the jointing area
- Clean the planning unit and the heater plate surfaces with a clean lint-free cloth
- Ensure the heater is cold and the power to unit is off
- It is recommended that two dummy joints be made at the start of each jointing session to ensure removal of fine contaminated particles whenever the heater plate has been allowed to cool below 180 c or for a size change.

CLAMP AND ALIGNED THE COMPONENTS TO BE JOINED:

- Clamp the components in the butt fusion jointing machine and adjust as necessary to achieve prop-er alignment.

PLANNING THE PIPE OR FITTING ENDS:

- Plane the pipe or fitting ends to establish clean, parallel mating surfac-es

ALIGN THE PIPE OR FITTING ENDS:

- Remove any shavings from the pipe or fitting ends
- Inspect the pipe or fitting ends for incomplete planning, voids or other imperfections then bring them to-gether to check for proper alignment.
- The permissible gap width between pipe or fitting ends under alignment pressure is described in the fol-lowing table

Pipeoutside diameter(mm)	Gap width (mm)
≤335	0.5
400....< 630	1
630....<800	1.3
800....<1000	1.5
>1000	2

MEASURING THE DRAG AND COMPENSATING PRESSURE ACCORDINGLY:

Measure the gauge pressure required to overcome
the frictional drag of the machine and pipe
This pressure shall be added to the calculated bead-up and fusion jointing pressure.

MELT THE PIPE OR FITTING INTERFACES:

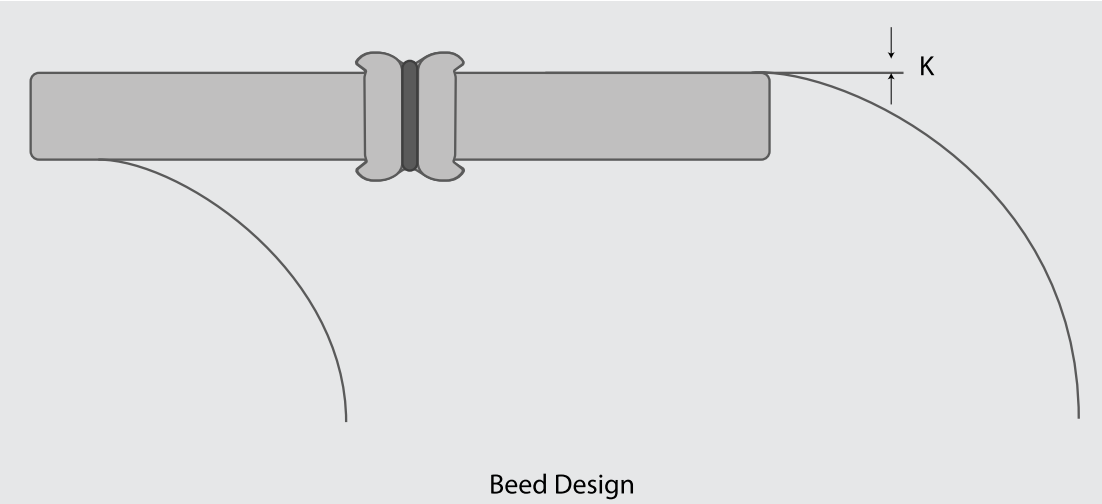
The surface of the heater plate that comes into contact with the pipe or fitting ends shall be clean, oil-free and coated with non-stick coating to prevent molten plastic from adhering to the heater plate surface.
Install the heater plate in the butt fusion machine and bring both of pipes or fitting ends simultaneously into full contact with the heater plate to produce molten surface for fusion jointing.
To ensure that full contact is made between the pipe or fitting ends and the heater plate , the initial contact shall be made under Alignment pressure (0.15Mpa). after holding the pressure until a specified bead height has formed, the pressure shall be adjusted to the heating-up pressure (≤0.02 MPa) without breaking contact between the heater plate and the pipe or fit- ting ends for a period equal to the hating-up time.

JOIN THE TWO PIPE OR FITTING ENDS TOGETHER BY APPLYING THE PROPER FUSION FORCE:

On completion of the heat soak time, pull the pipe or fitting ends from the heater plate. Then remove the heater plate and bring the molten pipe or fitting ends together within the specified time (changeover time). The joint shall be held at the jointing pressure (0.15 MPa) for a prescribed fusion jointing time (bulid-up time)

HOLD UNDER PRESSURE UNTIL THE JOINTS IS COOL:

The molten joint shall be held immobile under pressure in the butt fusion jointing machine for a period of time defined as the cooling tome in the machine under pressure. Allowing adequate time for cooling un-der pressure prior to removal from machine clamps is import- ant in order to develop strength and achieve joint integrity. Further cooling may take place in the machine without pressure or out of the machine, partic-ularly if working in high ambient temperatures.



Beed Design

PARAMETERS AND VALUES FOR FUSION JOINTING PROCEDURE

Heater Plate temperature °C	Alignment Pressure (Mpa)	Heating up Pressure (Mpa)		Jointing Pressure (Mpa)	
200 to 220	0.17 ± 0.02	≤ 0.02		0.17 ± 0.02	
Nominal Wall thickness (mm)	Minimum Bead Height (mm)	Minimum Heating Up time (s)	Maximum Change over time (s)	Maximum build-up time to achieve interface fusion pressured (s)	Cooling time in machine under pressure (s)
..4.5	0.5	45	5	5	6
4.5.....7.0	1	45.....70	5.....6	5.....6	6.....10
7.0.....12	1.5	70.....120	6.....8	6.....8	10.....16
12.....19	2	120.....190	8.....10	8 11	16.....24
19.....26	2.5	190.....260	10.....12	11.....14	24.....32
26.....37	3	260.....370	12.....16	14.....19	32 45
37.....50	3.5	370.....500	16.....20	19.....25	45.....60
50.....70	4	500.....700	20.....25	25.....35	60.....80