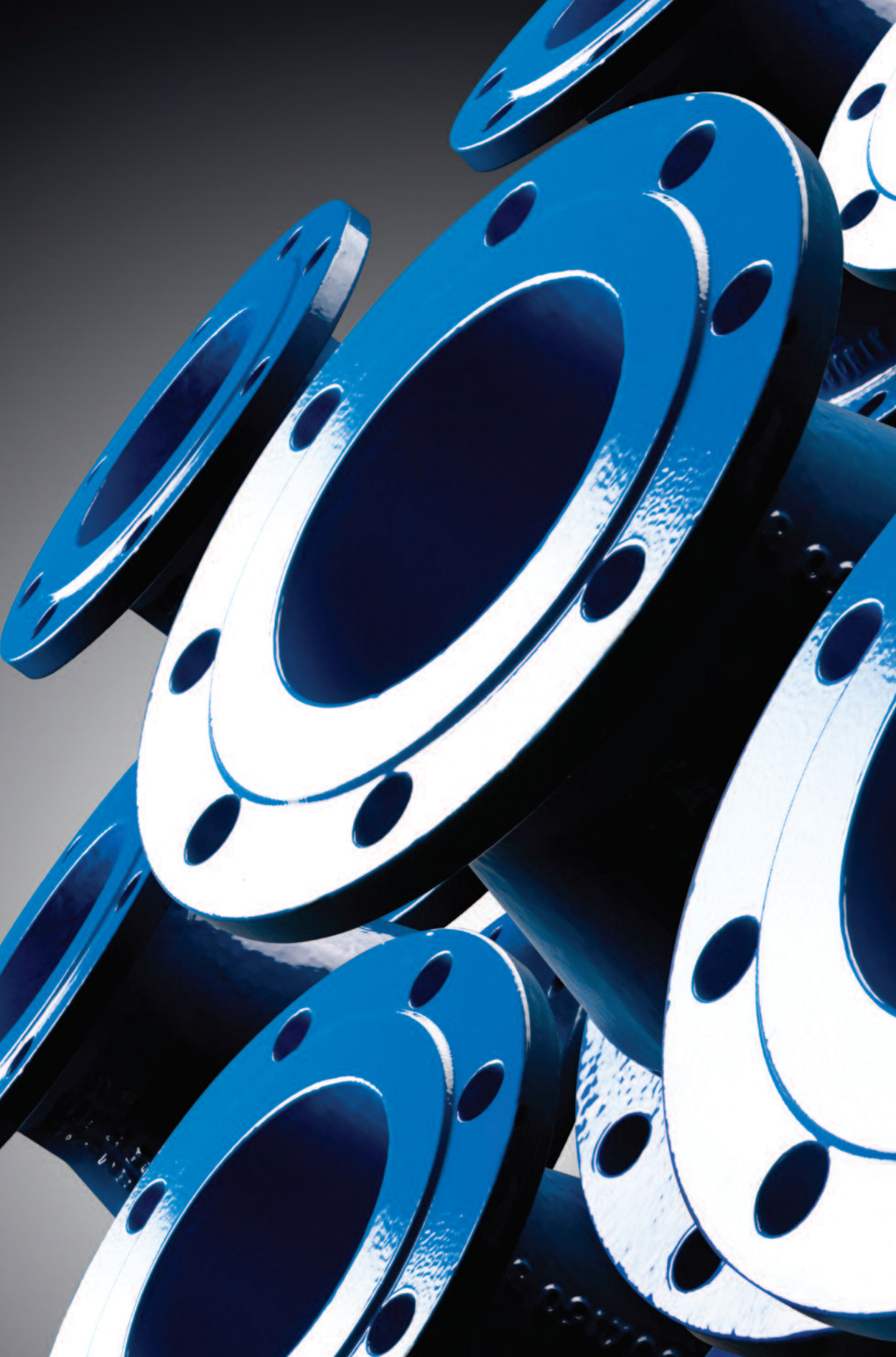


Sigma
Pipeline Solutions

Ductile Iron Pipes and Fittings

Potable Water and
Sewage Applications



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introduction

The ductile iron pipes, fittings and accessories included within this catalogue are manufactured in accordance with the British, European and International standards BS EN545, BS EN598 and ISO2531 which specify the requirements and test methods applicable for the construction of ductile iron pipelines:

BS EN545

- To convey water (e.g. potable water)
- With or without pressure
- To be installed below or above ground

BS EN598

- To convey surface water, domestic waste water and certain types of industrial effluents, either in separate systems or in combined systems
- Operating without pressure (gravity sewerage), or with positive or negative pressure
- To be installed below or above ground

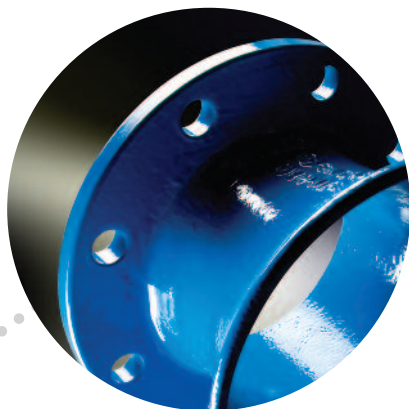
ISO 2531

- Applicable to pipes, fittings and accessories for pressure pipelines for water, other liquids or gas applications

This catalogue is intended to give engineers, consultants, buyers and contractors a comprehensive view of our products and their recommended applications.

All information given in this catalogue is correct at the time of going to print. Sigma Pipeline Solutions are constantly looking at developing and improving our products; we therefore reserve the right to change, without prior notice, any information contained within in this catalogue.

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DUCTILE IRON IS
100%
RECYCLABLE



quality

Sigma Pipeline Solutions' technical team stay ahead of the game - developing new and improved products and ensuring full compliance with any relevant existing or proposed legislation or quality standards.

Since its inception, Sigma Pipeline Solutions has specialised in the design, manufacture and supply of waterworks pipe and fittings, and is now one of the UK's largest stockholders of these products.

Pipe and fittings are Kite Marked to BS EN545, BS EN598 and ISO 2531 for water pipeline applications and Sigma's pipe is also approved by the Secretary of State under Regulation 31 of the Water Supply (Water Quality) Regulation 2000.

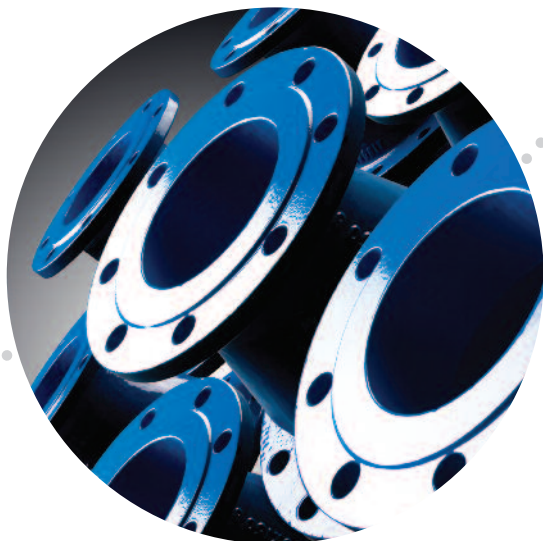
Sigma Pipeline Solutions' business quality is independently audited by the BSI and the scope of its operation is included within Sigma Pipeline Solutions' accreditation to ISO 9001:2008.

In December 2008 Sigma Pipeline Solutions achieved certification as an approved supplier listed under the Achilles Utility Vendors Database (UVDB) and Achilles Verify. More recently the scope of Sigma Pipeline Solutions operation, including its pipe fabrication facility, has been added to the Achilles' information requirements.

All of these accreditations are renewed annually.



ISO 9001



below ground joints

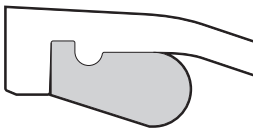
Push-fit (flexible) joints are the standard below ground joints used for conveying water.

Standard push-fit (flexible) requirements

In addition to normal anchorage precautions the joint is capable of:

- withstanding ground movement and settlement
- withstanding high operating pressures
- minimising the requirement for imported imbedment due to high stiffness
- coping with poor load bearing or unstable ground
- being laid in narrow trenches
- being laid easily, with no special equipment required

This table gives details on the maximum deflection when using the standard joint and gasket



DN (MM)	DEFLECTION (DEGREES)	MAX OPERATING PRESSURE PFA	MAX TEST PRESSURE PEA
80	5	60	65
100	5	60	65
150	5	60	65
200	4	60	65
250	4	54	64
300	4	49	64
350	3	45	59
400	3	42	56
450	3	40	53
500	3	38	51
600	3	36	48
700	2	34	46
800	2	32	43
900	1.5	31	42
1000	1.5	30	41

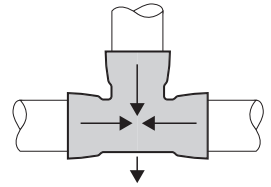
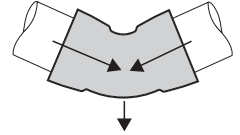
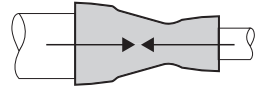
NB. Unrestrained push-fit (flexible) pipes may require anchorage due to hydraulic thrust along a pipeline such as changes in direction or reduction in diameter, laying in high slopes, unstable ground and at blank ends.

restrained below ground joints

Push-fit with self anchoring (end restraint) joints

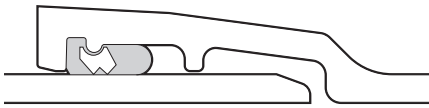
All pipeline systems that carry fluids under pressure are subject to:

- severe stresses
- hydraulic surges that appear at changes in direction
- reductions in diameter
- depth of cover
- height of water table
- topography
- native soils
- pipe orientation
- width of trench
- pipe diameter



The principle of anchoring joints is to reduce the potential for the joint to separate. Sigma Pipeline Solutions offer two types of end restraint which are dependent on pressure and installation conditions:

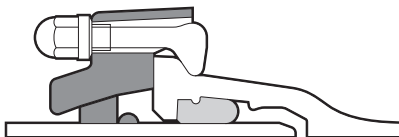
1 Standard push-fit (flexible) joint with anchor (SIT) gasket



Under pressure the joint will try to pull apart. This will cause the steel teeth to grip the spigot of the pipe preventing the joint from separating.

DN (MM)	DEFLECTION (DEGREES)	MAX OPERATING PRESSURE PFA	MAX TEST PRESSURE PEA
80	3	30	35
100	3	27	32
150	3	16	21
200	3	15	20
250	3	14	19
300	3	13	18
350	3	10	15
400	3	10	15
450	3	10	15
500	3	10	15
600	3	10	15

2 Push-fit (flexible) mechanical anchor (MR) joint



DN (MM)	DEFLECTION (DEGREES)	MAX OPERATING PRESSURE PFA	MAX TEST PRESSURE PEA
100	5	64	96
150	5	55	71
200	4	44	58
250	4	39	52
300	4	37	49
350	3	32	43
400	3	30	41
450	3	30	41
500	3	30	41
600	3	27	37
700	2	23	33
800	2	20	29

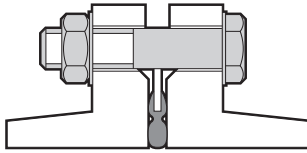


above ground joints

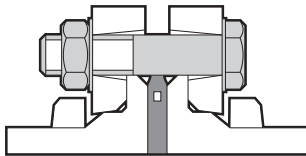
A flanged joint is standard for above ground applications and also for fitting ancillary products such as valves and hydrants below ground.

It is recommended that flanged joints are not buried wherever possible.

There are two types of flanged joint:



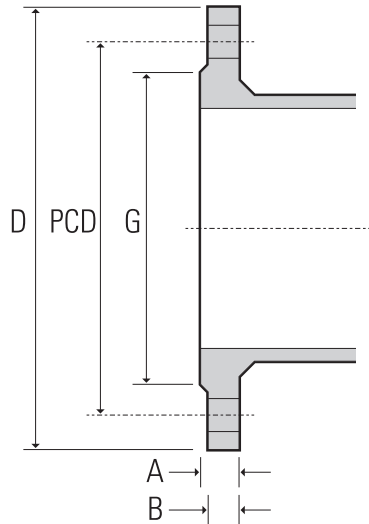
Fixed flange



Adjustable flange

Dependent upon the working pressure of the pipeline, flanges are drilled to BS EN1092-2, PN10, 16, 25 and 40.

PN16 is the standard drilling in the UK.



PN16

Maximum operating pressure (PMA) 16 bar

Allowable test pressure (PEA) 24 bar

NB. Bolt lengths are for joining ductile iron to ductile iron flanges

FLANGE DETAIL								BOLT SIZE		
DN (MM)	D (MM)	G (MM)	A (MM)	B (MM)	PCD (MM)	NO. OF HOLES	DIA. (MM)	DIA. (MM)	LENGTH (MM)	
80	200	132	19.0	16.0	160	8	19	M16	65	
100	220	156	19.0	16.0	180	8	19	M16	65	
150	285	211	19.0	16.0	240	8	23	M20	70	
200	340	266	20.0	17.0	295	12	23	M20	70	
250	400	319	22.0	19.0	355	12	28	M24	85	
300	455	370	24.5	20.5	410	12	28	M24	85	
350	520	429	26.5	22.5	470	16	28	M24	85	
400	580	480	28.0	24.0	525	16	31	M27	100	
450	640	548	30.0	26.0	585	20	31	M27	100	
500	715	609	31.5	27.5	650	20	34	M30	110	
600	840	720	36.0	31.0	770	20	37	M33	120	
700	910	794	39.5	34.5	840	24	37	M33	130	
800	1025	901	43.0	38.0	950	24	40	M36	140	
900	1125	1001	46.5	41.5	1050	28	40	M36	140	
1000	1255	1112	50.0	45.0	1170	28	43	M39	160	

PN10

Maximum operating pressure (PMA) 10 bar

Allowable test pressure (PEA) 16 bar

NB. Bolt lengths are for joining ductile iron to ductile iron flanges

FLANGE DETAIL								BOLT SIZE	
DN (MM)	D (MM)	G (MM)	A (MM)	B (MM)	PCD (MM)	NO. OF HOLES	DIA. (MM)	DIA. (MM)	LENGTH (MM)
80	200	132	19.0	16.0	160	8	19	M16	65
100	220	156	19.0	16.0	180	8	19	M16	65
150	285	211	19.0	16.0	240	8	23	M20	70
200	340	266	20.0	17.0	295	8	23	M20	70
250	400	319	22.0	19.0	350	12	23	M20	80
300	455	370	24.5	20.5	400	12	23	M20	80
350	505	429	24.5	20.5	460	16	23	M20	80
400	565	480	24.5	20.5	515	16	28	M24	85
450	615	530	25.5	21.5	565	20	28	M24	85
500	670	582	26.5	22.5	620	20	28	M24	90
600	780	682	30.0	25.0	725	20	31	M27	100
700	895	794	32.5	27.5	840	24	31	M27	110
800	1015	901	35.0	30.0	950	24	34	M30	110
900	1115	1001	37.5	32.5	1050	28	34	M30	120
1000	1230	1112	40.0	35.0	1160	28	37	M33	130

PN25

Maximum operating pressure (PMA) 25 bar

Allowable test pressure (PEA) 35 bar

NB. Bolt lengths are for joining ductile iron to ductile iron flanges

FLANGE DETAIL								BOLT SIZE	
DN (MM)	D (MM)	G (MM)	A (MM)	B (MM)	PCD (MM)	NO. OF HOLES	DIA. (MM)	DIA. (MM)	LENGTH (MM)
80	200	132	19.0	16.0	160	8	19	M16	65
100	235	156	19.0	16.0	190	8	23	M20	70
150	300	211	20.0	17.0	250	8	28	M24	85
200	360	274	22.0	19.0	310	12	28	M24	85
250	425	330	24.5	21.5	370	12	31	M27	100
300	485	389	27.5	23.5	430	16	31	M27	100
350	555	448	30.0	26.0	490	16	34	M30	110
400	620	503	32.0	28.0	550	16	37	M33	120
450	670	548	34.5	30.5	600	20	37	M33	120
500	730	609	36.5	32.5	660	20	37	M33	120
600	845	720	42.0	37.0	770	20	40	M36	140
700	960	820	46.5	41.5	875	24	43	M39	150
800	1085	928	51.0	46.0	990	24	49	M45	160
900	1185	1028	55.5	50.5	1090	28	49	M45	180
1000	1320	1140	60.0	55.0	1210	28	56	M52	200

PN40

Maximum operating pressure (PMA) 40 bar

Allowable test pressure (PEA) 53 bar

NB. Bolt lengths are for joining ductile iron to ductile iron flanges

FLANGE DETAIL								BOLT SIZE	
DN (MM)	D (MM)	G (MM)	A (MM)	B (MM)	PCD (MM)	NO. OF HOLES	DIA. (MM)	DIA. (MM)	LENGTH (MM)
80	200	133	19.0	16.0	160	8	19	M16	65
100	235	159	19.0	16.0	190	8	23	M20	70
150	300	214	26.0	23.0	250	8	28	M24	85
200	375	281	30.0	27.0	320	12	31	M27	100
250	450	343	34.0	31.0	385	12	34	M30	110
300	515	406	39.5	35.5	450	16	34	M30	120
350	580	465	44.0	40.0	510	16	37	M33	140
400	660	535	48.0	44.0	585	16	40	M36	150
450	685	560	50.0	46.0	610	20	40	M36	150
500	755	615	52.0	48.0	670	20	43	M39	160
600	890	735	58.0	53.0	795	20	49	M45	180



corrosion protection systems



Sigma Pipeline Solutions ductile iron pipes and fittings can be supplied with a range of different external coatings to suit all types of soil conditions and internal linings for the majority of process mediums. All coatings and linings comply fully with BS EN545, BS EN598, BS6076 and BS EN197.

All our pipe linings conveying potable water for human consumption are approved under Regulation 31 of the Water Supply (Water Quality) Regulations 2000.

The table below details the various recommended external protection systems for push-fit (flexible) pipe, dependent upon the soil conditions.

Standard corrosion systems	Soil conditions
STANDARD OFFER Pipes externally coated with 400 gm/m ² of ZnAl (85-15% ratio) with a finishing layer of epoxy. Finishing colour is dependent on the process medium.	Natural soils with a resistivity of 2500 ohm/cm
	Natural soils with a resistivity of between 1500 – 2500 ohm/cm without water table
	Natural soils with a resistivity between 1500 – 2500 ohm/cm with seasonal water table or permanent water logging
	Natural soils with a resistivity between 750 – 1500 ohm/cm without water table
	Natural soils with a resistivity between 750 – 1500 ohm/cm with seasonal water table or permanent water logging
TAPE WRAP Pipes externally coated with 400 gm/m ² of ZnAl (85-15% ratio) with a finishing layer of epoxy plus 25mm tape wrap.	Natural soils containing coal, ironstone or peat
	Natural soils with a resistivity below 750 ohm/cm
	Made up ground with light contamination eg. refuse sites, farmyard waste, with or without water table
	Stray electrical currents eg. crossing cathodically protected pipelines and DC traction systems
TAPE WRAP Pipes externally coated with 400 gm/m ² of ZnAl (85-15% ratio) with a finishing layer of epoxy plus 55% tape wrap.	Made up ground with flints, clinker etc. material likely to cause mechanical damage with or without water table
	Made up ground with solid chemical contamination eg. former industrial or chemical sites
	Made up ground with liquid chemical contamination eg. former industrial or chemical sites
	Tidal waters eg. estuarine conditions



corrosion protection systems

push-fit
(flexible) pipe



Process medium	Standard external coating		Standard internal lining
	DN 80-800mm	DN 900-1000mm	
Water (BS EN545)	Pipes are externally coated with 400g/m ² of zinc aluminium (85-15% ratio) with a finishing layer of blue epoxy	Pipes are externally coated with 200g/m ² of zinc with a finishing layer of blue epoxy	Pipes are centrifugally cement mortar lined as per the requirement of BS EN545 with blast furnace cement and finished with an epoxy seal coat
			Pipes are centrifugally cement mortar lined as per the requirement of BS EN545 with blast furnace cement
Sewage and surface water (BS EN598)	Pipes are externally coated with 400g/m ² of zinc aluminium (85-15% ratio) with a finishing layer of red epoxy	Pipes are externally coated with 200g/m ² of zinc with a finishing layer of red epoxy	Pipes are centrifugally cement mortar lined with high alumina cement as per the requirement of BS EN598

fabricated pipe



Process medium	Standard external coating		Standard internal lining
	DN 80-800mm	DN 900-1000mm	
Water (BS EN545)	Pipes are externally coated with 400g/m ² of zinc aluminium (85-15% ratio) with a finishing layer of blue epoxy	Pipes are externally coated with 200g/m ² of zinc with a finishing layer of blue epoxy	Pipes are centrifugally cement mortar lined as per the requirement of BS EN545 with blast furnace cement
Sewage and surface water (BS EN598)	Pipes are externally coated with 400g/m ² of zinc aluminium (85-15% ratio) with a finishing layer of red epoxy	Pipes are externally coated with 200g/m ² of zinc with a finishing layer of red epoxy	Pipes are centrifugally cement mortar lined with high alumina cement as per the requirement of BS EN598

fittings



Process medium	Standard coating
Water (BS EN545)	Fittings shall be supplied with a blue epoxy coating as per the requirements of BS EN545
Sewage and surface water (BS EN598)	Fittings shall be supplied with a red epoxy coating as per the requirements of BS EN598

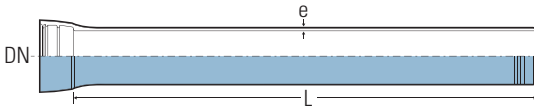
NB. All our pipe linings conveying potable water for human consumption are approved under Regulation 31 of the Water Supply (Water Quality) Regulations 2000.

All fittings are supplied epoxy coated conforming to BS EN 14901. Fittings to be used for potable applications are approved to BS 6920.



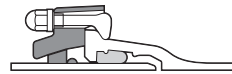
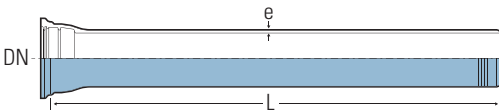
push-fit flexible pipe

EN545



DN (MM)	EXTERNAL DIAMETER DE		PRESSURE CLASS	MIN. WALL THICKNESS e	LENGTH (MM)	WEIGHT (KGS)	PRESSURE	
	NOMINAL	LIMIT DEVIATION					PFA	PEA
80	98	+1/-2.7	C40	4.38	5500	69	40	53
100	118	+1/-2.8	C40	4.40	5500	83	40	53
150	170	+1/-2.9	C40	4.45	5500	123	40	53
200	222	+1/-3.0	C40	4.60	5500	168	40	53
250	274	+1/-3.1	C40	5.45	5500	235	40	53
300	326	+1/-3.3	C40	6.20	5500	315	40	53
350	378	+1/-3.4	C30	6.35	5500	388	30	41
400	429	+1/-3.5	C30	6.50	5500	454	30	41
450	480	+1/-3.6	C30	6.85	5500	532	30	41
500	532	+1/3.8	C30	7.40	5500	627	30	41
600	635	+1/-4.0	C30	8.60	5500	847	30	41
700	738	+1/-4.3	C25	8.80	5500	1046	25	35
800	842	+1/-4.5	C25	9.60	5500	1288	25	35
900	945	+1/-4.8	C25	10.60	5500	1573	25	35
1000	1048	+1/-5.0	C25	11.60	5500	1889	25	35

EN545 mechanical restrained (MRTJ) pipe

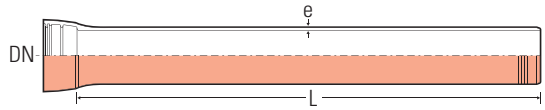


DN (MM)	EXTERNAL DIAMETER DE		PRESSURE CLASS	MIN. WALL THICKNESS e	LENGTH (MM)	WEIGHT (KGS)	PRESSURE	
	NOMINAL	LIMIT DEVIATION					PFA	PEA
100	118	+1/-2.8	K9	6.0	6000	138	64	96
150	170	+1/-2.9	K9	6.0	6000	165	55	71
200	222	+1/-3.0	K9	6.3	6000	222	44	58
250	274	+1/-3.1	K9	6.8	6000	288	39	52
300	326	+1/-3.3	K9	7.2	6000	366	37	49
350	378	+1/-3.4	K9	7.7	6000	483	30	41
400	429	+1/-3.5	K9	8.1	6000	573	30	41
450	480	+1/-3.6	K9	8.6	6000	678	30	41
500	532	+1/3.8	K9	9.0	6000	786	30	41
600	635	+1/-4.0	K9	9.9	6000	1020	27	37
700	738	+1/-4.3	K9	10.8	6000	1308	23	33
800	842	+1/-4.5	K9	11.7	6000	1602	20	29



push-fit flexible pipe

EN598



DN (MM)	EXTERNAL DIAMETER DE		PRESSURE CLASS	MIN. WALL THICKNESS e	LENGTH (MM)	WEIGHT (KGS)	PRESSURE	
	NOMINAL	LIMIT DEVIATION					PFA	PEA
80	98	+1/-2.7	PP	4.8	5500	74	40	53
100	118	+1/-2.8	PP	4.8	5500	89	40	53
150	170	+1/-2.9	PP	4.8	5500	134	40	53
200	222	+1/-3.0	PP	4.9	5500	179	40	53
250	274	+1/-3.1	PP	5.3	5500	235	38	51
300	326	+1/-3.3	PP	5.6	5500	293	35	47
350	378	+1/-3.4	PP	6.0	5500	373	32	44
400	429	+1/-3.5	PP	6.3	5500	443	30	41
450	480	+1/-3.6	PP	6.7	5500	521	29	40
500	532	+1/3.8	PP	7.0	5500	600	28	38
600	635	+1/-4.0	PP	7.7	5500	781	26	36
700	738	+1/-4.3	PP	9.6	5500	1117	29	40
800	842	+1/-4.5	PP	10.4	5500	1370	28	38
900	945	+1/-4.8	PP	11.2	5500	1644	27	37
1000	1048	+1/-5.0	PP	12.0	5500	1938	26	36

Both **EN545** and **EN598** state that for pipes DN < 300, the external diameter of the pipe barrel measured with a circumferential tape will be such as to allow the assembly of the joint over at least two thirds of the pipe length from the spigot end when the pipe needs to be cut on site.

For DN > 300, the same requirement applies to 5% of pipes.

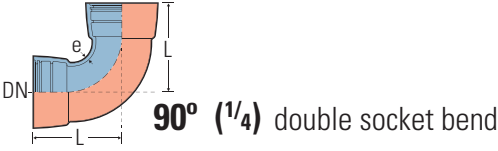
As the dimensions of the steel moulds in which ductile iron pipes are cast vary with time and use, batches of pipes from a single mould on a given production run are likely to be either all suitable for cutting or none suitable for cutting.

Should you require pipes suitable for cutting this must be specified at time of order.



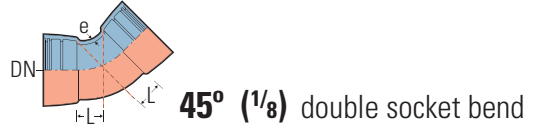
push-fit fittings

All pressure pipelines using push-fit (socket and spigot) flexible joints are subject to forces which try to separate the joint, particularly at changes of orientation, surge, change in diameter or blank ends, and as such some form of adequate restraint is necessary.



90° (1/4) double socket bend

DN (MM)	KEY DIMENSIONS L	SERIES	MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE PFA	PEA
80	85	B	7.0	6.0	60	65
100	100	B	7.2	9.0	60	65
150	130	B	7.8	15.0	60	65
200	160	B	8.4	23.0	60	65
250	240	B	9.0	41.0	54	65
300	280	B	9.6	60.0	49	64
350	370	-	10.2	79.0	45	59
400	420	-	10.8	108.0	42	56
450	470	-	11.4	138.0	40	53
500	520	-	12.0	177.0	38	51
600	620	-	13.2	285.0	36	48
700	720	-	14.4	435.0	34	46
800	820	-	15.6	640.0	32	43
900	920	-	16.8	818.0	31	42
1000	1020	-	18.0	1093.0	30	41



45° (1/8) double socket bend

DN (MM)	KEY DIMENSIONS L	SERIES	MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE PFA	PEA
80	50	B	7.0	7.0	60	65
100	60	B	7.2	8.0	60	65
150	70	B	7.8	14.0	60	65
200	80	B	8.4	20.0	60	65
250	135	B	9.0	31.0	54	65
300	155	B	9.6	49.0	49	64
350	175	A	10.2	58.0	45	59
400	195	A	10.8	80.0	42	56
450	220	A	11.4	99.0	40	53
500	240	A	12.0	128.0	38	51
600	285	A	13.2	186.0	36	48
700	330	A	14.4	331.0	34	46
800	370	A	15.6	428.0	32	43
900	415	A	16.8	604.0	31	42
1000	460	A	18.0	770.0	30	41



22.5° (1/16) double socket bend

DN (MM)	KEY DIMENSIONS L	SERIES	MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE PFA	PEA
80	40	A/B	7.0	5.6	60	65
100	50	B	7.2	7.0	60	65
150	60	B	7.8	12.0	60	65
200	70	B	8.4	19.0	60	65
250	80	B	9.0	26.0	54	65
300	90	B	9.6	42.0	49	64
350	100	B	10.2	48.0	45	59
400	110	A/B	10.8	63.0	42	56
450	120	A/B	11.4	78.0	40	53
500	130	A	12.0	99.0	38	51
600	150	A	13.2	142.0	36	48
700	175	A	14.4	265.0	34	46
800	195	A	15.6	337.0	32	43
900	220	A	16.8	468.0	31	42
1000	240	A	18.0	588.0	30	41



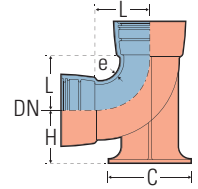
11.25° (1/32) double socket bend

DN (MM)	KEY DIMENSIONS L	SERIES	MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE PFA	PEA
80	30	A/B	7.0	5.0	60	65
100	30	A/B	7.2	7.0	60	65
150	40	B	7.8	11.0	60	65
200	45	B	8.4	17.0	60	65
250	55	B	9.0	23.0	54	65
300	55	A/B	9.6	37.0	49	64
350	60	A/B	10.2	41.0	45	59
400	65	A/B	10.8	54.0	42	56
450	70	A/B	11.4	76.0	40	53
500	75	A	12.0	84.0	38	51
600	85	A	13.2	121.0	36	48
700	95	A	14.4	261.0	34	46
800	110	A	15.6	265.0	32	43
900	120	A	16.8	390.0	31	42
1000	130	A	18.0	485.0	30	41



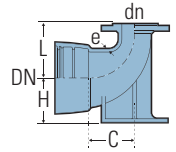
90° (1/4) double socket duckfoot bend

DN (MM)	KEY DIMENSIONS			MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
	L	H	C			PFA	PEA
80	100	110	180	7.0	13.0	60	65
100	120	125	200	7.2	16.0	60	65
150	170	160	250	7.8	29.0	60	65
200	220	190	300	8.4	45.0	60	65
250	270	225	350	9.0	69.0	54	65
300	320	255	400	9.6	101.0	49	64



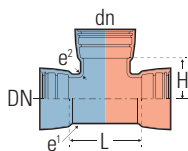
90° (1/4) PN10-16 (fixed) flange on socket duckfoot bend

DN (MM)	dn (MM)	KEY DIMENSIONS			MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
		L	H	C			PFA	PEA
80	80	165	95	140	7.0	13.0	16	24
100	80	165	105	140	7.2	18.0	16	24
150	80	165	135	140	7.8	25.0	16	24



push-fit fittings

all socket tee



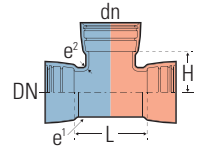
DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
80	80	175	85	B	7.0	7.0	11.0	60	65
100	80	165	90	B	7.2	7.0	13.0	60	65
100	100	195	100	B	7.2	7.2	14.5	60	65
150	80	180	120	B	7.8	7.0	18.0	60	65
150	100	200	125	B	7.8	7.2	20.0	60	65
150	150	260	130	B	7.8	7.8	27.0	60	65
200	80	180	145	B	8.4	7.0	26.0	43	48
200	100	200	150	B	8.4	7.2	27.0	43	48
200	150	260	155	B	8.4	7.8	32.0	43	48
200	200	320	160	B	8.4	8.4	38.0	43	48
250	80	185	185	B	9.0	7.0	36.0	32	37
250	100	205	190	B	9.0	7.2	36.5	32	37
250	150	265	190	B	9.0	7.8	45.0	32	37
250	200	320	190	B	9.0	8.4	48.0	32	37
250	250	380	190	B	9.0	9.0	55.0	32	37
300	80	220	235	-	9.6	7.0	48.0	40	45
300	100	210	220	B	9.6	7.2	49.0	40	45
300	150	265	220	B	9.6	7.8	60.0	40	45
300	200	325	220	B	9.6	8.4	62.0	40	45
300	250	380	220	B	9.6	9.0	77.0	40	45
300	300	440	220	B	9.6	9.6	82.0	40	45
350	80	225	260	-	10.2	7.0	59.0	25	30
350	100	225	260	-	10.2	7.2	60.0	25	30
350	150	340	265	-	10.2	7.8	71.0	25	30
350	350	515	270	-	10.2	10.2	108.0	25	30
400	100	225	290	-	10.8	7.2	75.0	25	30
400	150	340	290	-	10.8	7.8	88.0	25	30
400	200	340	290	-	10.8	8.4	95.0	25	30
400	250	575	295	-	10.8	9.0	124.0	25	30
400	300	575	295	-	10.8	9.6	131.0	25	30
400	400	575	300	-	10.8	10.8	139.0	25	30
450	80	230	315	-	11.4	7.0	87.0	25	30
450	100	230	315	-	11.4	7.2	90.0	25	30
450	150	345	320	-	11.4	7.8	106.0	25	30
450	200	345	320	-	11.4	8.4	109.0	25	30
450	250	635	320	-	11.4	9.0	156.0	25	30
450	300	635	325	-	11.4	9.6	164.0	25	30
450	350	635	310	-	11.4	10.2	166.0	25	30
450	400	635	315	-	11.4	10.8	174.0	25	30
450	450	635	330	-	11.4	11.4	173.0	24	30



push-fit fittings

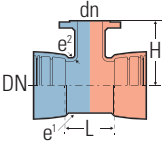
all socket tee continued:

DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
500	80	230	345	-	12.0	7.0	110.0	25	30
500	100	230	345	-	12.0	7.2	114.0	25	30
500	150	350	345	-	12.0	7.8	126.0	25	30
500	200	350	345	-	12.0	8.4	129.0	25	30
500	250	580	350	-	12.0	9.0	172.0	25	30
500	300	580	350	-	12.0	9.6	172.5	25	30
500	350	350	340	-	12.0	10.2	186.0	25	30
500	400	580	340	-	12.0	10.8	190.0	25	30
500	450	695	345	-	12.0	11.4	216.0	25	30
500	500	695	350	-	12.0	12.0	224.0	25	30
600	80	335	400	-	13.2	7.0	161.0	25	30
600	100	335	400	-	13.2	7.2	166.0	25	30
600	150	355	400	-	13.2	7.8	168.0	25	30
600	300	585	405	-	13.2	9.6	226.0	25	30
600	450	820	400	-	13.2	11.4	310.0	25	30
600	600	820	410	-	13.2	13.2	330.0	25	30
700	150	360	410	-	14.4	7.8	289.0	25	30
700	200	360	415	-	14.4	8.4	291.0	25	30
700	400	580	430	-	14.4	10.8	367.0	25	30
700	700	900	450	-	14.4	14.4	549.0	25	30
800	800	1020	505	-	15.6	15.6	717.0	25	30
900	900	1145	560	-	16.8	16.8	968.0	25	30
1000	1000	1265	625	-	18.0	18.0	1244.0	24	29



push-fit fittings

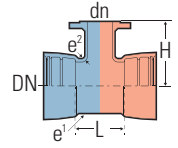
PN16 (fixed) flange on double socket tee



DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
80	80	175	165	B	7.0	7.0	13.0	40	53
100	80	165	170	B	7.2	7.0	14.0	16	24
100	100	195	180	B	7.2	7.2	16.0	16	24
150	80	180	200	B	7.8	7.0	20.0	16	24
150	100	200	205	B	7.8	7.2	22.0	16	24
150	150	260	220	B	7.8	7.8	27.0	16	24
200	80	180	225	B	8.4	7.0	27.0	16	24
200	100	200	230	B	8.4	7.2	29.0	16	24
200	150	260	245	B	8.4	7.8	35.0	16	24
200	200	320	260	B	8.4	8.4	42.0	16	24
250	80	180	265	A/B	9.0	7.0	37.0	16	24
250	100	205	270	B	9.0	7.2	38.0	16	24
250	150	265	280	B	9.0	7.8	49.0	16	24
250	200	320	290	B	9.0	8.4	52.0	16	24
250	250	380	300	B	9.0	9.0	61.0	16	24
300	80	185	295	B	9.6	7.0	50.0	16	24
300	100	210	300	B	9.6	7.2	51.0	16	24
300	150	265	310	B	9.6	7.8	63.0	16	24
300	200	325	320	B	9.6	8.4	67.0	16	24
300	250	380	330	B	9.6	9.0	83.0	16	24
300	300	440	340	B	9.6	9.6	90.0	16	24
350	80	185	325	B	10.2	7.0	56.0	16	24
350	100	205	330	A	10.2	7.2	57.0	16	24
350	150	270	340	B	10.2	7.8	75.0	16	24
350	350	495	380	A	10.2	10.2	122.0	16	24
400	80	185	355	A	10.8	7.0	71.0	16	24
400	100	210	360	A/B	10.8	7.2	72.0	16	24
400	150	270	370	A/B	10.8	7.8	90.0	16	24
400	200	325	380	A	10.8	8.4	92.0	16	24
400	250	385	390	B	10.8	9.0	131.0	16	24
400	300	440	400	A	10.8	9.6	135.0	16	24
400	400	560	420	A/B	10.8	10.8	150.0	16	24
450	80	215	390	-	11.4	7.0	89.0	16	24
450	100	215	390	B	11.4	7.2	90.0	16	24
450	150	270	400	B	11.4	7.8	110.0	16	24
450	300	445	430	B	11.4	9.6	174.0	16	24
450	400	560	450	B	11.4	10.8	191.0	16	24
450	450	620	460	B	11.4	11.4	198.0	16	24

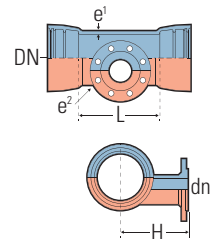
PN16 (fixed) flange on double socket tee continued:

DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
500	80	215	420	-	12.0	7.0	91.0	16	24
500	100	215	420	A	12.0	7.2	103.0	16	24
500	150	330	430	-	12.0	7.8	128.0	16	24
500	200	330	440	A	12.0	8.4	131.5	16	24
500	300	390	460	-	12.0	9.6	185.0	16	24
500	400	565	480	A	12.0	10.8	210.0	16	24
500	500	680	500	A	12.0	12.0	258.0	16	24
600	80	355	470	-	13.2	7.0	167.0	16	24
600	100	355	475	-	13.2	7.2	168.5	16	24
600	150	355	490	-	13.2	7.8	170.5	16	24
600	200	340	500	A	13.2	8.4	172.0	16	24
600	300	585	525	-	13.2	9.6	238.0	16	24
600	400	570	540	A	13.2	10.8	268.0	16	24
600	600	800	580	A	13.2	13.2	388.0	16	24
700	150	360	525	-	14.4	7.8	276.0	16	24
700	200	345	525	A	14.4	8.4	291.0	16	24
700	400	575	555	A	14.4	10.8	383.0	16	24
700	700	925	600	A	14.4	14.4	561.0	16	24
800	150	360	585	-	15.6	7.8	507.0	16	24
800	200	350	585	A	15.6	8.4	357.0	16	24
800	400	580	615	A	15.6	10.8	463.0	16	24
800	600	1045	645	A	15.6	13.2	605.0	16	24
800	800	1045	675	A	15.6	15.6	746.0	16	24
900	900	1170	750	A	16.8	16.8	1008.0	16	24
1000	1000	1290	825	A	18.0	18.0	1297.0	16	24



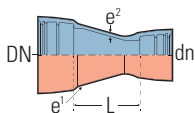
PN16 (fixed) flange on double socket level invert tee

DN (MM)	dn (MM)	KEY DIMENSIONS		WALL		WEIGHT (KGS)	PRESSURE	
		L	H	e ¹	e ²		PFA	PEA
150	80	190	220	7.8	7.0	24.0	16	24
200	80	190	250	8.4	7.0	33.0	16	24
250	80	220	275	9.0	7.0	45.0	16	24
250	100	220	275	9.0	7.2	46.0	16	24
300	80	220	305	9.6	7.0	50.0	16	24
300	100	220	305	9.6	7.2	53.0	16	24
400	100	225	365	10.8	7.2	76.0	16	24



push-fit fittings

double socket taper

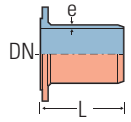


DN (MM)	dn (MM)	KEY DIMENSIONS		WALL		WEIGHT (KGS)	PRESSURE	
		L	SERIES	e ¹	e ²		PFA	PEA
100	80	85	B	7.2	7.0	7.0	60	65
150	80	190	A/B	7.8	7.0	10.0	60	65
150	100	150	A/B	7.8	7.2	9.5	60	65
200	100	250	A/B	8.4	7.2	15.0	60	65
200	150	145	B	8.4	7.8	16.0	60	65
250	150	250	A/B	9.0	7.8	23.0	54	65
250	200	150	A/B	9.0	8.4	22.0	54	65
300	150	370	B	9.6	7.8	31.0	49	64
300	200	250	A/B	9.6	8.4	33.0	49	64
300	250	150	A/B	9.6	9.0	34.0	49	64
350	200	370	B	10.2	8.4	46.0	45	59
350	250	260	A/B	10.2	9.0	43.0	45	59
400	300	160	A/B	10.2	9.6	42.0	45	59
400	200	360	-	10.8	8.4	57.0	42	56
400	250	360	A	10.8	9.0	60.0	42	56
400	300	260	A/B	10.8	9.6	63.0	42	56
400	350	160	A	10.8	10.2	52.0	42	56
450	250	260	-	11.4	9.0	77.0	40	53
450	300	260	-	11.4	9.6	79.0	40	53
450	350	260	A	11.4	10.2	79.0	40	53
450	400	160	A/B	11.4	10.8	69.0	40	53
500	250	360	-	12.0	9.0	97.0	38	51
500	300	360	-	12.0	9.6	95.0	38	51
500	350	360	A	12.0	10.2	89.0	38	51
500	400	260	A	12.0	10.8	84.0	38	51
500	450	160	-	12.0	11.4	78.0	38	51
600	300	460	-	13.2	9.6	145.0	36	48
600	350	460	-	13.2	10.2	148.0	36	48
600	400	460	A	13.2	10.8	132.0	36	48
600	450	360	-	13.2	11.4	124.0	36	48
600	500	260	A	13.2	12.0	116.0	36	48
700	500	480	A	14.4	12.0	215.0	34	46
700	600	280	A	14.4	13.2	193.0	34	46
800	600	480	A	15.6	13.2	270.0	32	43
800	700	280	A	15.6	14.4	277.0	32	43



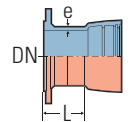
PN16 (fixed) flange spigot piece

DN (MM)	KEY DIMENSIONS		WALL e	WEIGHT (KGS)	PRESSURE	
	L	SERIES			PFA	PEA
80	350	A/B	7.0	8.0	40	53
100	360	A/B	7.2	10.0	16	24
150	380	A/B	7.8	16.0	16	24
200	400	A/B	8.4	23.0	16	24
250	420	A/B	9.0	33.0	16	24
300	440	A/B	9.6	45.0	16	24
350	460	A/B	10.2	55.0	16	24
400	480	A/B	10.8	75.0	16	24
450	500	A/B	11.4	90.0	16	24
500	520	A	12.0	115.0	16	24
600	560	A	13.2	161.0	16	24
700	600	A	14.4	218.0	16	24
800	600	A	15.6	254.0	16	24
900	600	A	16.8	320.0	16	24
1000	600	A	18.0	402.0	16	24



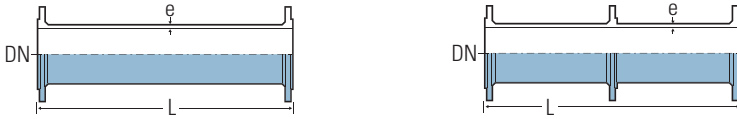
PN16 (fixed) flange socket piece

DN (MM)	KEY DIMENSIONS		WALL e	WEIGHT (KGS)	PRESSURE	
	L	SERIES			PFA	PEA
80	130	A	7.0	7.0	40	53
100	130	A	7.2	9.0	16	24
150	135	A	7.8	13.0	16	24
200	140	A	8.4	18.0	16	24
250	145	A	9.0	26.0	16	24
300	150	A	9.6	37.0	16	24
350	155	A	10.2	47.0	16	24
400	160	A	10.8	63.0	16	24
450	165	A	11.4	72.0	16	24
500	170	A	12.0	93.0	16	24
600	180	A	13.2	135.0	16	24
700	190	A	14.4	193.0	16	24
800	200	A	15.6	252.0	16	24
900	210	A	16.8	327.0	16	24
1000	220	A	18.0	415.0	16	24



fabricated pipe

BS EN545 double flanged pipe



DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL		WEIGHT PER MTR.	FLANGE WEIGHTS		PRESSURE	
					CLASS	e		PN16	PUDDLE	PFA	PEA
80	120	5200	180	260	C40	4.38	12.0	3.4	4.0	16	24
100	130	5200	200	280	C40	4.40	15.0	4.0	4.0	16	24
150	130	5200	200	300	C40	4.45	22.0	6.4	7.0	16	24
200	140	5200	215	320	C40	4.60	30.0	9.5	11.0	16	24
250	150	5200	230	340	C40	5.45	43.0	13.7	15.0	16	24
300	160	5200	245	360	C30	6.20	57.0	17.1	19.0	16	24
350	170	5200	260	380	C30	6.35	70.0	21.6	23.0	16	24
400	280	5200	425	400	C30	6.50	82.0	27.0	29.0	16	24
450	290	5200	440	410	C30	6.85	97.0	36.0	39.0	16	24
500	300	5200	455	420	C30	7.40	114.0	46.0	50.0	16	24
600	320	5200	485	460	C30	8.60	154.0	69.7	75.0	16	24
700	360	5200	545	520	C25	8.80	190.0	78.6	82.0	16	24
800	360	5000	660	540	C25	9.60	234.0	104.4	107.0	16	24

NB.
Pressures do
not relate to
puddle flanges

BS EN545 single flanged spigot pipe



DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL		WEIGHT PER MTR.	FLANGE WEIGHTS		PRESSURE	
					CLASS	e		PN16	PUDDLE	PFA	PEA
80	160	5200	215	260	C40	4.38	12.0	3.4	4.0	16	24
100	170	5200	225	280	C40	4.40	15.0	4.0	4.0	16	24
150	170	5200	225	300	C40	4.45	22.0	6.4	7.0	16	24
200	175	5200	235	320	C40	4.60	30.0	9.5	11.0	16	24
250	180	5200	250	340	C40	5.45	43.0	13.7	15.0	16	24
300	185	5200	260	360	C30	6.20	57.0	17.1	19.0	16	24
350	175	5200	255	380	C30	6.35	70.0	21.6	23.0	16	24
400	230	5200	365	400	C30	6.50	82.0	27.0	29.0	16	24
450	235	5200	375	420	C30	6.85	97.0	36.0	39.0	16	24
500	240	5200	385	440	C30	7.40	114.0	46.0	50.0	16	24
600	250	5200	404	460	C30	8.60	154.0	69.7	75.0	16	24
700	270	5200	445	520	C25	8.80	190.0	78.6	82.0	16	24
800	270	5000	445	580	C25	9.60	234.0	104.4	107.0	16	24

NB.
Pressures do
not relate to
puddle flanges

fabricated pipe

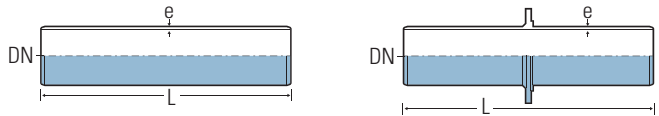
BS EN545 single flanged socket pipe



DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL CLASS	e	WEIGHT PER MTR.	FLANGE PN16	WEIGHTS PUDDLE	PRESSURE	
										PFA	PEA
80	160	5200	220	280	C40	4.38	12.0	3.4	4.0	16	24
100	160	5200	220	300	C40	4.40	15.0	4.0	4.0	16	24
150	160	5200	220	340	C40	4.45	22.0	6.4	7.0	16	24
200	180	5200	240	370	C40	4.60	30.0	9.5	11.0	16	24
250	190	5200	260	380	C40	5.45	43.0	13.7	15.0	16	24
300	200	5200	280	400	C30	6.20	57.0	17.1	19.0	16	24
350	200	5200	280	420	C30	6.35	70.0	21.6	23.0	16	24
400	260	5200	400	460	C30	6.50	82.0	27.0	29.0	16	24
450	270	5200	410	500	C30	6.85	97.0	36.0	39.0	16	24
500	280	5200	430	520	C30	7.40	114.0	46.0	50.0	16	24
600	300	5200	455	540	C30	8.60	154.0	69.7	75.0	16	24
700	340	5200	510	600	C25	8.80	190.0	78.6	82.0	16	24
800	340	5200	520	620	C25	9.60	234.0	104.4	107.0	16	24

NB.
Pressures do not relate to puddle flanges

BS EN545 double spigot pipe

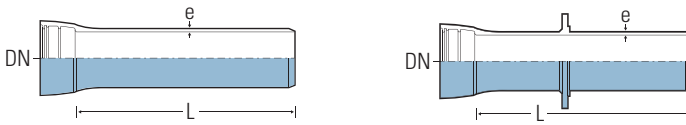


DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	WALL CLASS	e	WEIGHT PER MTR.	PRESSURE	
							PFA	PEA
80	190	5200	220	C40	4.38	12.0	40	53
100	190	5200	220	C40	4.40	15.0	40	53
150	190	5200	220	C40	4.45	22.0	40	53
200	200	5200	220	C40	4.60	30.0	40	53
250	210	5200	220	C40	5.45	43.0	40	53
300	220	5200	220	C30	6.20	57.0	40	53
350	200	5200	190	C30	6.35	70.0	30	41
400	210	5200	190	C30	6.50	82.0	30	41
450	210	5200	190	C30	6.85	97.0	30	41
500	215	5200	190	C30	7.40	114.0	30	41
600	220	5200	190	C30	8.60	154.0	30	41
700	235	5200	190	C25	8.80	190.0	25	35
800	240	5200	190	C25	9.60	234.0	25	35

NB.
Pressures do not relate to puddle flanges

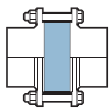
fabricated pipe

BS EN545 short length socket spigot pipe



DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	WALL CLASS	e	WEIGHT PER MTR.	PRESSURE PFA	PEA
80	300	5500	230	C40	4.38	12.0	40	53
100	300	5500	230	C40	4.40	15.0	40	53
150	300	5500	230	C40	4.45	22.0	40	53
200	300	5500	240	C40	4.60	30.0	40	53
250	300	5500	250	C40	5.45	43.0	40	53
300	300	5500	260	C30	6.20	57.0	40	53
350	300	5500	240	C30	6.35	70.0	30	41
400	300	5500	300	C30	6.50	82.0	30	41
450	300	5500	300	C30	6.85	97.0	30	41
500	300	5500	320	C30	7.40	114.0	30	41
600	300	5500	330	C30	8.60	154.0	30	41
700	450	5500	370	C25	8.80	190.0	25	35
800	450	5500	370	C25	9.60	234.0	25	35

NB.
Pressures do not relate to puddle flanges

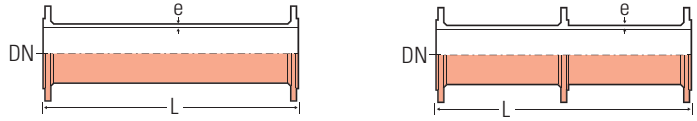


pipe block

DN (MM)	MIN. L (MM)	MAX. L (MM)
80	50	134
100	50	134
150	50	146
200	50	160
250	80	170
300	80	222
350	80	299
400	120	299
450	120	349
500	120	349
600	120	499
700	120	549
800	200	749

fabricated pipe

BS EN598 double flanged pipe

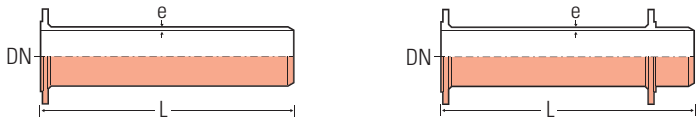


DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL CLASS	e	WEIGHT PER MTR.	FLANGE PN16	WEIGHTS PUDDLE	PRESSURE PFA	PEA
80	120	5200	180	260	PP	4.8	14.0	3.4	4.0	16	24
100	130	5200	200	280	PP	4.8	16.0	4.0	4.0	16	24
150	130	5200	200	300	PP	4.8	24.5	6.4	7.0	16	24
200	140	5200	215	320	PP	4.9	32.5	9.5	11.0	16	24
250	150	5200	230	340	PP	5.3	43.0	13.7	15.0	16	24
300	160	5200	245	360	PP	5.6	54.0	17.1	19.0	16	24
350	170	5200	260	380	PP	6.0	68.0	21.6	23.0	16	24
400	280	5200	425	400	PP	6.3	81.0	27.0	29.0	16	24
450	290	5200	440	410	PP	6.7	95.0	36.0	39.0	16	24
500	300	5200	455	420	PP	7.0	109.0	46.0	50.0	16	24
600	320	5200	485	460	PP	7.7	142.0	69.7	75.0	16	24
700	360	5200	545	520	PP	9.6	203.0	78.6	82.0	16	24
800	360	5200	660	540	PP	10.4	249.0	104.4	107.0	16	24

NB.
PP denotes
pressure pipe

Pressures do
not relate to
puddle flanges

BS EN598 single flanged spigot pipe



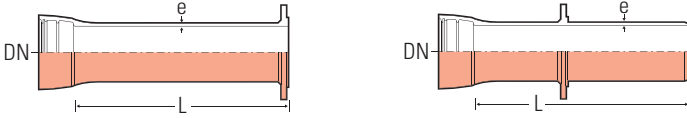
DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL CLASS	e	WEIGHT PER MTR.	FLANGE PN16	WEIGHTS PUDDLE	PRESSURE PFA	PEA
80	160	5200	215	260	PP	4.8	14.0	3.4	4.0	16	24
100	170	5200	225	280	PP	4.8	16.0	4.0	4.0	16	24
150	170	5200	225	300	PP	4.8	24.5	6.4	7.0	16	24
200	175	5200	235	320	PP	4.9	32.5	9.5	11.0	16	24
250	180	5200	250	340	PP	5.3	43.0	13.7	15.0	16	24
300	185	5200	260	360	PP	5.6	54.0	17.1	19.0	16	24
350	175	5200	255	380	PP	6.0	68.0	21.6	23.0	16	24
400	230	5200	365	400	PP	6.3	81.0	27.0	29.0	16	24
450	235	5200	375	420	PP	6.7	95.0	36.0	39.0	16	24
500	240	5200	385	440	PP	7.0	109.0	46.0	50.0	16	24
600	250	5200	404	460	PP	7.7	142.0	69.7	75.0	16	24
700	270	5200	445	520	PP	9.6	203.0	78.6	82.0	16	24
800	270	5200	445	580	PP	10.4	249.0	104.4	107.0	16	24

NB.
PP denotes
pressure pipe

Pressures do
not relate to
puddle flanges

fabricated pipe

BS EN598 single flanged socket pipe

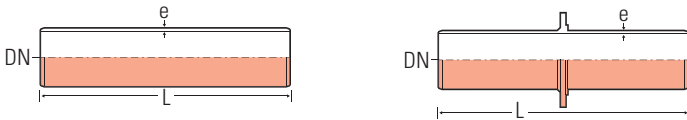


DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	MIN. L WITH BOSS	WALL		WEIGHT PER MTR.	FLANGE WEIGHTS		PRESSURE	
					CLASS	e		PN16	PUDDLE	PFA	PEA
80	160	5200	220	280	PP	4.8	14.0	3.4	4.0	16	24
100	160	5200	220	300	PP	4.8	16.0	4.0	4.0	16	24
150	160	5200	220	340	PP	4.8	24.5	6.4	7.0	16	24
200	180	5200	240	370	PP	4.9	32.5	9.5	11.0	16	24
250	190	5200	260	380	PP	5.3	43.0	13.7	15.0	16	24
300	200	5200	280	400	PP	5.6	54.0	17.1	19.0	16	24
350	200	5200	280	420	PP	6.0	68.0	21.6	23.0	16	24
400	260	5200	400	460	PP	6.3	81.0	27.0	29.0	16	24
450	270	5200	410	500	PP	6.7	95.0	36.0	39.0	16	24
500	280	5200	430	520	PP	7.0	109.0	46.0	50.0	16	24
600	300	5200	455	540	PP	7.7	142.0	69.7	75.0	16	24
700	340	5200	510	600	PP	9.6	203.0	78.6	82.0	16	24
800	340	5200	520	620	PP	10.4	249.0	104.4	107.0	16	24

NB.
PP denotes
pressure pipe

Pressures do
not relate to
puddle flanges

BS EN598 double spigot pipe



DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	WALL		WEIGHT PER MTR.	PRESSURE	
				CLASS	e		PFA	PEA
80	190	5200	220	PP	4.8	14.0	40	53
100	190	5200	220	PP	4.8	16.0	40	53
150	190	5200	220	PP	4.8	24.5	40	53
200	200	5200	220	PP	4.9	32.5	40	53
250	210	5200	220	PP	5.3	43.0	40	53
300	220	5200	220	PP	5.6	54.0	40	53
350	200	5200	190	PP	6.0	68.0	30	41
400	210	5200	190	PP	6.3	81.0	30	41
450	210	5200	190	PP	6.7	95.0	30	41
500	215	5200	190	PP	7.0	109.0	30	41
600	220	5200	190	PP	7.7	142.0	30	41
700	235	5200	190	PP	9.6	203.0	25	35
800	240	5200	190	PP	10.4	249.0	25	35

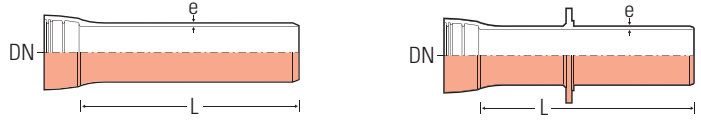
NB.
PP denotes
pressure pipe

Pressures do
not relate to
puddle flanges



fabricated pipe

BS EN598 short length socket spigot pipe



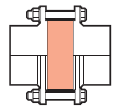
DN (MM)	MIN. L (MM)	MAX. L (MM)	MIN. L WITH PUDDLE FLANGE	WALL CLASS	e	WEIGHT PER MTR.	PRESSURE PFA	PEA
80	300	5500	230	PP	4.8	14.0	40	53
100	300	5500	230	PP	4.8	16.0	40	53
150	300	5500	230	PP	4.8	24.5	40	53
200	300	5500	240	PP	4.9	32.5	40	53
250	300	5500	250	PP	5.3	43.0	40	53
300	300	5500	260	PP	5.6	54.0	40	53
350	300	5500	240	PP	6.0	68.0	30	41
400	300	5500	300	PP	6.3	81.0	30	41
450	300	5500	300	PP	6.7	95.0	30	41
500	300	5500	320	PP	7.0	109.0	30	41
600	300	5500	330	PP	7.7	142.0	30	41
700	450	5500	370	PP	9.6	203.0	25	35
800	450	5500	370	PP	10.4	249.0	25	35

NB.
PP denotes
pressure pipe

Pressures do
not relate to
puddle flanges

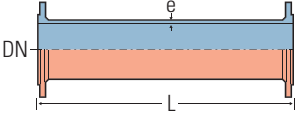
pipe block

DN (MM)	MIN. L (MM)	MAX. L (MM)
80	50	134
100	50	134
150	50	146
200	50	160
250	80	170
300	80	222
350	80	299
400	120	299
450	120	349
500	120	349
600	120	499
700	120	549
800	200	749



PN16 fixed flanged fittings

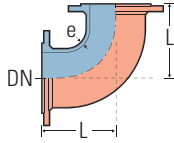
double cast riser pipe



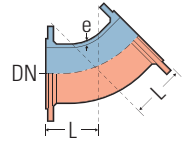
DN (MM)	LENGTH (MM)	WALL e	WEIGHT (KGS)	PRESSURE	
				PFA	PEA
80	100	7.0	7.0	16	24
80	150	7.0	8.0	16	24
80	200	7.0	8.5	16	24
80	250	7.0	9.0	16	24
80	300	7.0	10.0	16	24
80	350	7.0	10.5	16	24
80	400	7.0	11.0	16	24
80	450	7.0	12.0	16	24
80	500	7.0	13.0	16	24
80	600	7.0	14.0	16	24
80	1000	7.0	19.0	16	24
100	100	7.2	9.0	16	24
100	150	7.2	9.5	16	24
100	200	7.2	10.0	16	24
100	250	7.2	11.0	16	24
100	300	7.2	12.0	16	24
100	350	7.2	13.0	16	24
100	400	7.2	14.0	16	24
100	450	7.2	15.0	16	24
100	500	7.2	15.5	16	24
100	600	7.2	17.0	16	24
100	1000	7.2	24.0	16	24
150	150	7.8	14.0	16	24
150	200	7.8	14.5	16	24
150	250	7.8	15.0	16	24
150	300	7.8	17.0	16	24
150	350	7.8	19.0	16	24
150	400	7.8	20.0	16	24
150	450	7.8	22.0	16	24
150	500	7.8	25.0	16	24
150	1000	7.8	38.0	16	24
200	200	8.4	19.0	16	24
200	300	8.4	25.0	16	24
200	400	8.4	29.0	16	24
200	500	8.4	33.0	16	24
250	250	9.0	27.0	16	24
250	300	9.0	31.0	16	24
250	500	9.0	39.0	16	24
300	250	9.6	42.0	16	24
300	300	9.6	47.0	16	24
300	500	9.6	59.0	16	24

PN16 fixed flanged fittings

double flanged
90° (1/4) short radius bend



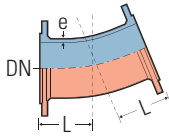
double
45° (1/8) flanged bend



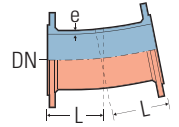
DN (MM)	KEY DIMENSIONS		MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
	LENGTH	SERIES			PFA	PEA
80	165	A/B	7.0	9.0	16	24
100	180	A/B	7.2	11.0	16	24
150	220	A/B	7.8	22.0	16	24
200	260	A/B	8.4	32.0	16	24
250	350	A/B	9.0	53.0	16	24
300	400	A/B	9.6	75.0	16	24
350	450	A/B	10.2	110.0	16	24
400	500	A/B	10.8	145.0	16	24
450	550	A/B	11.4	184.0	16	24
500	600	A/B	12.0	242.0	16	24
600	700	A/B	13.2	373.0	16	24
700	800	A/B	14.4	463.0	16	24
800	900	A/B	15.6	570.0	16	24
900	1000	A/B	16.8	750.0	16	24
1000	1100	A/B	18.0	998.0	16	24

DN (MM)	KEY DIMENSIONS		MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
	LENGTH	SERIES			PFA	PEA
80	130	A/B	7.0	10.0	16	24
100	140	A/B	7.2	11.0	16	24
150	160	A/B	7.8	19.0	16	24
200	180	A/B	8.4	27.0	16	24
250	350	A	9.0	54.0	16	24
300	400	A	9.6	82.0	16	24
350	298	A	10.2	94.0	16	24
400	324	A	10.8	122.0	16	24
450	350	A/B	11.4	152.0	16	24
500	375	A	12.0	200.0	16	24
600	426	A	13.2	304.0	16	24
700	478	A	14.4	335.0	16	24
800	529	A	15.6	444.0	16	24
900	581	A	16.8	582.0	16	24
1000	632	A	18.0	757.0	16	24
250	245	B	9.0	48.0	16	24
300	275	B	9.6	67.0	16	24

double
22.5° (1/16) flanged bend



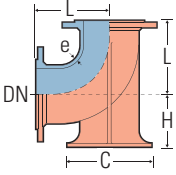
double
11.25° (1/32) flanged bend



DN (MM)	KEY DIMENSIONS		MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
	LENGTH	SERIES			PFA	PEA
80	105	A	7.0	11.0	16	24
100	110	A	7.2	12.0	16	24
150	109	A	7.8	21.0	16	24
200	131	A	8.4	27.0	16	24
250	190	A/B	9.0	41.0	16	24
300	210	A/B	9.6	56.0	16	24
350	210	A	10.2	-	16	24
400	239	A	10.8	107.0	16	24
450	349	-	11.4	135.0	16	24
500	375	-	12.0	175.0	16	24
600	426	-	13.2	267.0	16	24
700	300	-	14.4	342.0	16	24
800	335	-	15.6	448.0	16	24
900	375	-	16.8	588.0	16	24
1000	410	-	18.0	773.0	16	24
80	120	B	7.0	10.0	16	24
100	130	B	7.2	12.0	16	24
150	150	B	7.8	19.0	16	24
200	170	B	8.4	28.0	16	24

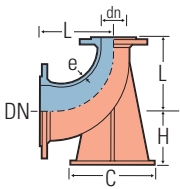
DN (MM)	KEY DIMENSIONS		MIN. WALL THICKNESS e	WEIGHT (KGS)	PRESSURE	
	LENGTH	SERIES			PFA	PEA
80	113	A	7.0	11.0	16	24
100	115	A/B	7.2	13.0	16	24
150	113	A	7.8	31.0	16	24
200	132	A	8.4	62.0	16	24
250	165	A/B	9.0	39.0	16	24
300	175	A/B	9.6	52.0	16	24
350	191	A	10.2	72.0	16	24
400	205	A/B	10.8	87.0	16	24
450	349	-	11.4	136.0	16	24
500	375	-	12.0	177.0	16	24
600	426	-	13.2	268.0	16	24
700	230	-	14.4	343.0	16	24
800	255	-	15.6	451.0	16	24
900	280	-	16.8	592.0	16	24
1000	310	-	18.0	778.0	16	24
80	110	B	7.0	10.0	16	24
150	130	B	7.8	18.0	16	24
200	145	B	8.4	28.0	16	24

PN16 fixed flanged fittings



90° (1/4) duckfoot bend

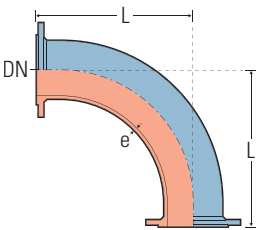
DN (MM)	KEY DIMENSIONS			SERIES	WALL e*	WEIGHT (KGS)	PRESSURE	
	L	H	C				PFA	PEA
80	165	110	180	A/B	7.0	13.0	16	24
100	180	125	200	A/B	7.2	16.0	16	24
150	220	160	250	A/B	7.8	31.0	16	24
200	260	190	300	A/B	8.4	54.0	16	24
250	350	225	350	A/B	9.0	87.0	16	24
300	400	255	400	A/B	9.6	124.0	16	24
350	450	290	450	A/B	10.2	169.0	16	24
400	500	320	500	A/B	10.8	225.0	16	24
450	550	355	550	A/B	11.4	258.0	16	24
500	600	385	600	A/B	12.0	340.0	16	24
600	700	450	700	A/B	13.2	520.0	16	24
700	800	515	800	-	14.4	566.0	16	24
800	900	580	900	-	15.6	798.0	16	24
900	1000	645	1000	-	16.8	1050.0	16	24
1000	1100	710	1100	-	18.0	1380.0	16	24



90° (1/4) reducing duckfoot bend

DN (MM)	dn	KEY DIMENSIONS			WALL e*	WEIGHT (KGS)	PRESSURE	
		L	C	H			PFA	PEA
100	80	180	305	125	7.2	16	16	24
150	80	220	380	160	7.8	23	16	24

NB.
These are available in BS EN545 as standard



90° long radius bend

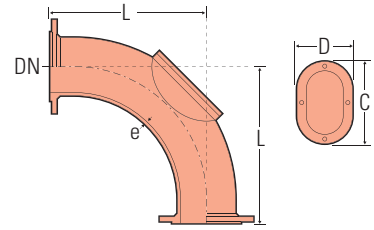
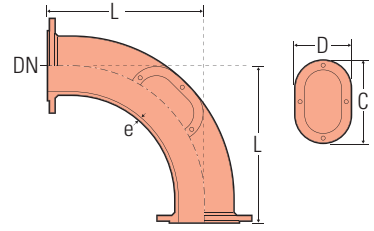
DN (MM)	KEY DIM L	WALL e*	WEIGHT (KGS)	PRESSURE	
				PFA	PEA
80	380	7.0	14.0	16	24
100	400	7.2	18.0	16	24
150	450	7.8	30.0	16	24
200	500	8.4	46.0	16	24
250	550	9.0	65.0	16	24
300	600	9.6	90.0	16	24
350	650	10.2	121.0	16	24
400	700	10.8	157.0	16	24
450	750	11.4	197.0	16	24
500	800	12.0	252.0	16	24
600	900	13.2	379.0	16	24

PN16 fixed flanged fittings

90° long radius access bend type A and type B

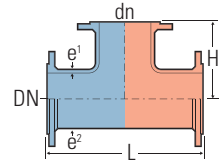
DN (MM)	KEY DIMENSIONS			WALL e	WEIGHT (KGS)	PRESSURE	
	L	C	D			PFA	PEA
80	380	90	55	7.0	14.0	2	3.5
100	400	115	70	7.2	18.0	2	3.5
150	450	150	80	7.8	30.0	2	3.5
200	500	200	115	8.4	46.0	2	3.5
250	550	250	150	9.0	66.0	2	3.5
300	600	250	150	9.6	90.0	2	3.5

NB.
These are available in BS EN598 as standard



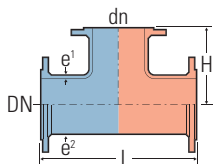
all flanged tee

DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
80	50	330	160	-	7.0	7.0	14.0	40	53
80	80	330	165	A/B	7.0	7.0	15.6	40	53
100	50	360	170	-	7.2	7.0	18.4	16	24
100	80	360	175	A	7.2	7.0	19.4	16	24
100	100	360	180	A/B	7.2	7.2	20.3	16	24
150	50	440	200	-	7.8	7.0	28.3	16	24
150	80	440	205	A	7.8	7.0	30.4	16	24
150	100	440	210	A	7.8	7.2	31.0	16	24
150	150	440	220	A/B	7.8	7.8	34.0	16	24
200	80	520	235	A	8.4	7.0	41.5	16	24
200	100	520	240	A	8.4	7.2	42.6	16	24
200	150	520	250	A	8.4	7.8	44.9	16	24
200	200	520	260	A/B	8.4	8.4	51.9	16	24
250	80	700	265	-	9.0	7.0	65.0	16	24
250	100	700	275	A	9.0	7.2	67.0	16	24
250	150	700	300	-	9.0	7.8	70.0	16	24
250	200	700	325	A	9.0	8.4	75.0	16	24
250	250	700	350	A	9.0	9.0	87.0	16	24
300	80	800	290	-	9.6	7.0	91.0	16	24
300	100	800	300	A	9.6	7.2	93.0	16	24
300	150	800	325	-	9.6	7.8	96.0	16	24
300	200	800	350	A	9.6	8.4	101.0	16	24
300	250	800	375	-	9.6	9.0	108.0	16	24
300	300	800	400	A	9.6	9.6	117.0	16	24



PN16 fixed flanged fittings

all flanged tee continued:

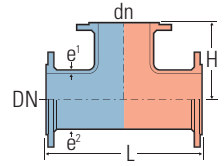


DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
100	80	330	170	B	7.2	7.0	18.0	16	24
150	80	360	200	B	7.8	7.0	30.0	16	24
150	100	380	205	B	7.8	7.2	31.0	16	24
200	80	380	225	B	8.4	7.0	40.0	16	24
200	100	400	230	B	8.4	7.2	41.0	16	24
200	150	460	245	B	8.4	7.8	44.0	16	24
250	80	405	265	B	9.0	7.0	52.3	16	24
250	100	425	270	B	9.0	7.2	57.2	16	24
250	150	485	280	B	9.0	7.8	62.8	16	24
250	200	540	290	B	9.0	8.4	68.1	16	24
250	250	600	300	B	9.0	9.0	78.2	16	24
300	80	425	295	B	9.6	7.0	70.7	16	24
300	100	450	300	B	9.6	7.2	72.5	16	24
300	150	505	310	B	9.6	7.8	86.6	16	24
300	200	565	320	B	9.6	8.4	94.6	16	24
300	250	620	330	B	9.6	9.0	103.5	16	24
300	300	680	340	B	9.6	9.6	110.0	16	24
350	80	850	325	-	10.2	7.0	131.0	16	24
350	100	850	325	A	10.2	7.2	133.0	16	24
350	150	850	325	-	10.2	7.8	135.0	16	24
350	200	850	325	A	10.2	8.4	137.0	16	24
350	250	850	325	-	10.2	9.0	138.5	16	24
350	350	850	425	A	10.2	10.2	167.0	16	24
400	80	900	350	-	10.8	7.0	166.0	16	24
400	100	900	350	A	10.8	7.2	168.0	16	24
400	150	900	350	-	10.8	7.8	169.0	16	24
400	200	900	350	A	10.8	8.4	173.0	16	24
400	250	900	350	-	10.8	9.0	175.0	16	24
400	300	900	450	-	10.8	9.6	177.0	16	24
400	350	900	450	-	10.8	10.2	180.0	16	24
400	400	900	450	A	10.8	10.8	194.0	16	24
450	80	950	375	-	11.4	7.0	187.0	16	24
450	100	950	375	A	11.4	7.2	188.0	16	24
450	150	950	375	-	11.4	7.8	190.0	16	24
450	200	950	375	A	11.4	8.4	193.0	16	24
450	250	950	375	-	11.4	9.0	213.0	16	24
450	300	950	475	-	11.4	9.6	216.0	16	24
450	350	950	475	-	11.4	10.2	221.0	16	24
450	400	950	475	-	11.4	10.8	229.0	16	24
450	450	950	475	A	11.4	11.4	237.0	16	24
500	80	1000	400	-	12.0	7.0	237.5	16	24
500	100	1000	400	A	12.0	7.2	241.0	16	24
500	150	1000	400	-	12.0	7.8	243.0	16	24
500	200	1000	400	A	12.0	8.4	245.0	16	24
500	250	1000	400	-	12.0	9.0	258.0	16	24
500	300	1000	500	-	12.0	9.6	272.0	16	24

PN16 fixed flanged fittings

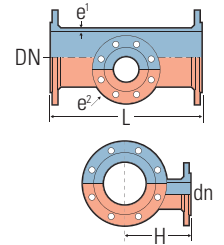
all flanged tee continued:

DN (MM)	dn (MM)	KEY DIMENSIONS			WALL		WEIGHT (KGS)	PRESSURE	
		L	H	SERIES	e ¹	e ²		PFA	PEA
500	400	1000	500	A	12.0	10.8	276.0	16	24
500	500	1000	500	A	12.0	12.0	304.0	16	24
600	80	1100	450	-	13.2	7.0	340.0	16	24
600	100	1100	450	-	13.2	7.2	345.0	16	24
600	150	1100	450	-	13.2	7.8	369.0	16	24
600	200	1100	450	A	13.2	8.4	372.0	16	24
600	250	1100	450	-	13.2	9.0	375.0	16	24
600	300	1100	550	-	13.2	9.6	379.0	16	24
600	400	1100	550	A	13.2	10.8	387.0	16	24
600	600	1100	550	A	13.2	13.2	491.0	16	24
700	200	650	525	A	14.4	8.4	298.0	16	24
700	400	870	555	A	14.4	10.8	381.0	16	24
700	700	1200	600	A	14.4	14.4	548.0	16	24
800	200	690	585	A	15.6	8.4	390.0	16	24
800	400	910	615	A	15.6	10.8	472.0	16	24
800	600	1350	645	A	15.6	13.2	699.0	16	24
800	800	1350	675	A	15.6	15.6	741.0	16	24
900	200	730	645	A	16.8	8.4	484.0	16	24
900	400	950	675	A	16.8	10.8	578.0	16	24
900	600	1500	705	A	16.8	13.2	900.0	16	24
900	900	1500	750	A	16.8	16.8	974.0	16	24
1000	200	770	705	A	18.0	8.4	629.0	16	24
1000	400	990	735	A	18.0	10.8	732.0	16	24
1000	600	1650	765	A	18.0	13.2	1112.0	16	24
1000	1000	1650	825	A	18.0	18.0	1290.0	16	24

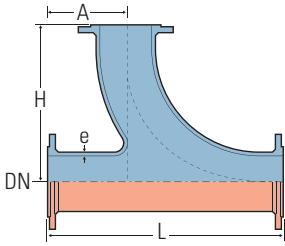


all flanged level invert tee

DN (MM)	dn (MM)	KEY DIMENSIONS		WALL		WEIGHT (KGS)	PRESSURE	
		L	H	e ¹	e ²		PFA	PEA
100	80	360	195	7.2	7.0	20.0	16	24
150	80	440	220	7.8	7.0	30.0	16	24
200	80	520	250	8.4	7.0	43.0	16	24
250	100	700	275	9.0	7.2	69.0	16	24
300	80	800	305	9.6	7.0	92.0	16	24
300	100	800	305	9.6	7.2	96.0	16	24
300	150	800	305	9.6	7.8	99.0	16	24
350	150	850	340	10.2	7.8	140.0	16	24
400	100	900	365	10.8	7.2	170.0	16	24
400	150	900	365	10.8	7.8	176.0	16	24
450	100	950	380	11.4	7.2	189.0	16	24
450	150	950	380	11.4	7.8	197.0	16	24
500	150	1000	400	12.0	7.8	267.0	16	24
600	150	1100	450	13.2	7.8	360.0	16	24
600	200	1100	450	13.2	8.4	370.0	16	24

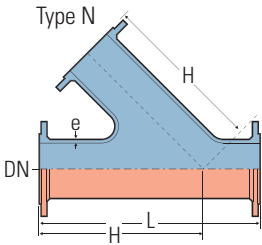


PN16 fixed flanged fittings



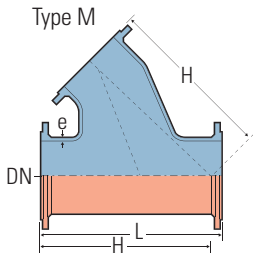
radial tee

DN (MM)	KEY DIMENSIONS			WALL e	WEIGHT (KGS)	PRESSURE	
	L	H	A			PFA	PEA
80	545	380	165	7.0	23.0	40	53
100	580	400	180	7.2	30.0	16	24
150	670	450	220	7.8	49.0	16	24
200	760	500	260	8.4	73.0	16	24
250	900	550	350	9.0	106.0	16	24
300	1000	600	400	9.6	146.0	16	24
350	1100	650	450	10.2	204.0	16	24
400	1200	700	500	10.8	298.0	16	24
450	1300	750	650	11.4	375.0	16	24
500	1400	800	600	12.0	423.0	16	24
600	1600	900	700	13.2	633.0	16	24



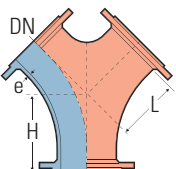
45° angle branch

DN (MM)	TYPE	KEY DIMENSIONS		WALL e	WEIGHT (KGS)	PRESSURE	
		L	H			PFA	PEA
80	N	500	375	7.0	21.0	40	53
100	N	540	405	7.2	27.0	16	24
150	N	640	480	7.8	47.0	16	24
200	N	735	560	8.4	71.0	16	24
250	N	830	640	9.0	105.0	16	24
300	N	930	715	9.6	147.0	16	24
350	M	880	790	10.2	168.0	16	24
400	M	970	870	10.8	205.0	16	24
450	M	1060	950	11.4	277.0	16	24
500	M	1140	1025	12.0	353.0	16	24
600	M	1310	1180	13.2	541.0	16	24



'Y' pipe

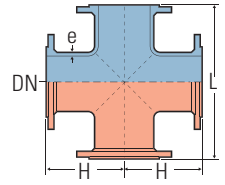
DN (MM)	KEY DIMENSIONS		WALL e	WEIGHT (KGS)	PRESSURE	
	L	H			PFA	PEA
80	165	165	7.0	15.0	40	53
100	180	180	7.2	18.0	16	24
150	220	220	7.8	33.0	16	24
200	260	260	8.4	48.0	16	24
250	350	350	9.0	82.0	16	24
300	400	400	9.6	117.0	16	24
350	450	450	10.2	166.0	16	24
400	500	500	10.8	219.0	16	24
450	550	550	11.4	280.0	16	24
500	600	600	12.0	364.0	16	24
600	700	700	13.2	563.0	16	24



PN16 fixed flanged fittings

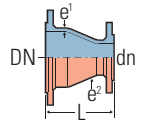
CROSS

DN (MM)	KEY DIMENSIONS		WALL e	WEIGHT (KGS)	PRESSURE	
	L	H			PFA	PEA
80	330	165	7.0	21.0	40	53
100	360	180	7.2	25.0	16	24
150	440	220	7.8	41.0	16	24
200	520	260	8.4	61.0	16	24
250	700	350	9.0	100.0	16	24
300	800	400	9.6	143.0	16	24
350	850	425	10.2	189.0	16	24
400	900	450	10.8	286.0	16	24
450	950	475	11.4	341.0	16	24
500	1000	500	12.0	370.0	16	24
600	1100	550	13.2	542.0	16	24



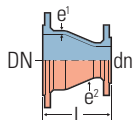
concentric taper

DN (MM)	dn (MM)	KEY DIMENSIONS		WALL		WEIGHT (KGS)	PRESSURE	
		L	SERIES	e^1	e^2		PFA	PEA
80	50	200	-	7.0	7.0	7.0	40	53
100	50	200	-	7.2	7.0	9.0	16	24
100	80	200	A	7.2	7.0	8.0	16	24
150	80	200	-	7.8	7.0	13.0	16	24
150	100	200	-	7.8	7.2	13.0	16	24
200	80	300	-	8.4	7.0	20.0	16	24
200	100	300	-	8.4	7.2	20.5	16	24
200	150	300	A	8.4	7.8	23.0	16	24
250	100	300	-	9.0	7.2	28.0	16	24
250	150	300	-	9.0	7.8	29.0	16	24
250	200	300	A	9.0	8.4	30.0	16	24
300	100	300	-	9.6	7.2	35.0	16	24
300	150	300	-	9.6	7.8	37.0	16	24
300	200	300	-	9.6	8.4	39.0	16	24
300	250	300	A	9.6	9.0	40.0	16	24
100	80	195	B	7.2	7.0	8.0	16	24
200	150	235	B	8.4	7.8	21.0	16	24
250	200	250	B	9.0	8.4	30.0	16	24
300	250	265	B	9.6	9.0	39.0	16	24



PN16 fixed flanged fittings

concentric taper continued:



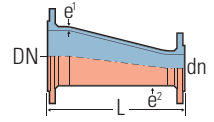
DN (MM)	dn (MM)	KEY DIMENSIONS		WALL		WEIGHT (KGS)	PRESSURE	
		L	SERIES	e ¹	e ²		PFA	PEA
350	200	600	-	10.2	8.4	71.0	16	24
350	250	300	-	10.2	9.0	77.0	16	24
350	300	300	A	10.2	9.6	84.0	16	24
400	200	600	-	10.8	8.4	74.0	16	24
400	250	600	-	10.8	9.0	77.0	16	24
400	300	300	A	10.8	9.6	84.0	16	24
400	350	300	A	10.8	10.2	67.0	16	24
450	250	600	-	11.4	9.0	88.0	16	24
450	300	600	-	11.4	9.6	95.0	16	24
450	350	600	-	11.4	10.2	104.0	16	24
450	400	300	A	11.4	10.8	81.0	16	24
500	250	700	-	12.0	9.0	124.0	16	24
500	300	600	-	12.0	9.6	111.0	16	24
500	350	600	-	12.0	10.2	142.0	16	24
500	400	600	A	12.0	10.8	130.0	16	24
500	450	300	-	12.0	11.4	102.0	16	24
600	300	800	-	13.2	9.6	171.0	16	24
600	350	700	-	13.2	10.2	174.0	16	24
600	400	600	-	13.2	10.8	164.0	16	24
600	450	600	-	13.2	11.4	175.0	16	24
600	500	600	A	13.2	12.0	190.0	16	24
700	400	800	-	14.4	10.8	212.0	16	24
700	450	700	-	14.4	11.4	213.0	16	24
700	500	600	-	14.4	12.0	208.0	16	24
700	600	600	A	14.4	13.2	243.0	16	24
800	500	800	-	15.6	12.0	284.0	16	24
800	600	600	-	15.6	13.2	275.0	16	24
800	700	600	A	15.6	14.4	295.0	16	24
900	700	600	-	16.8	14.4	333.0	16	24
900	800	600	A	16.8	15.6	364.0	16	24
1000	800	600	-	18.0	15.6	438.0	16	24
1000	900	600	A	18.0	16.8	448.0	16	24



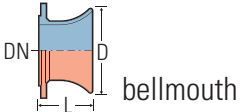
PN16 fixed flanged fittings

flat (eccentric) taper

DN (MM)	dn (MM)	KEY DIMENSION (L)	WALL		WEIGHT (KGS)	PRESSURE	
			e ¹	e ²		PFA	PEA
80	50	150	7.0	7.0	7.3	40	53
100	80	200	7.2	7.0	9.0	16	24
150	80	400	7.8	7.0	16.0	16	24
150	100	300	7.8	7.2	15.0	16	24
200	80	600	8.4	7.0	26.0	16	24
200	100	600	8.4	7.2	27.0	16	24
200	150	300	8.4	7.8	22.0	16	24
250	150	600	9.0	7.8	38.0	16	24
250	200	300	9.0	8.4	30.0	16	24
300	150	600	9.6	7.8	35.0	16	24
300	200	600	9.6	8.4	39.0	16	24
300	250	300	9.6	9.0	40.0	16	24
350	200	600	10.2	8.4	61.0	16	24
350	250	600	10.2	9.0	67.5	16	24
350	300	300	10.2	9.6	52.5	16	24
400	200	600	10.8	8.4	74.0	16	24
400	250	600	10.8	9.0	77.0	16	24
400	300	600	10.8	9.6	84.0	16	24
400	350	300	10.8	10.2	68.0	16	24
450	250	600	11.4	8.4	91.0	16	24
450	300	600	11.4	9.6	95.0	16	24
450	350	600	11.4	10.2	98.0	16	24
450	400	300	11.4	10.8	88.0	16	24
500	250	300	12.0	9.0	118.0	16	24
500	400	300	12.0	10.8	145.0	16	24
600	400	300	13.2	10.8	157.0	16	24
600	450	300	13.2	11.4	174.0	16	24
600	500	300	13.2	12.0	196.0	16	24
700	450	700	14.4	11.4	220.0	16	24
700	500	600	14.4	12.0	213.0	16	24
700	600	600	14.4	13.2	249.0	16	24
800	500	800	15.6	12.0	295.0	16	24
800	600	600	15.6	13.2	282.0	16	24
800	700	600	15.6	14.4	304.0	16	24
900	700	600	16.8	14.4	340.0	16	24
900	800	600	16.8	15.6	371.0	16	24
1000	800	600	18.0	15.6	428.0	16	24
1000	900	600	18.0	16.8	464.0	16	24

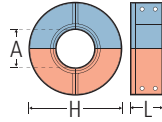


PN16 fixed flanged fittings



bellmouth

DN (MM)	KEY DIMENSIONS		WEIGHT (KGS)
	L	D	
80	135	160	5.0
100	140	185	6.0
150	155	245	10.0
200	170	310	15.0
250	190	370	21.0
300	210	435	29.0
350	225	495	39.0
400	245	560	50.0
450	260	620	63.0
500	280	685	83.0
600	300	810	122.0
700	340	945	154.0
800	380	1055	203.0
900	420	1165	250.0

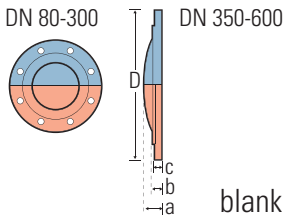


split (loose)
puddle flange

DN (MM)	KEY DIMENSIONS			WEIGHT (KGS)
	H	L	A	
80	260	110	100	12.0
100	305	110	120	15.0
150	390	130	172	23.0
200	430	130	224	28.0
250	490	130	276	37.0
300	555	130	329	46.0
350	610	130	381	50.0
400	660	150	432	62.0
450	725	150	483	73.0
500	790	150	535	85.0
600	900	165	638	120.0
700	1000	165	746	144.0

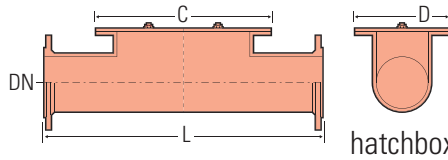
NB.

Split puddle flanges should only be used with spun pipe and where no thrust load is expected. The flange is fitted to the pipe using any packing material such as rubber, roof felt etc. Packing material is NOT supplied with the flange.



blank flange

DN (MM)	D	KEY DIMENSIONS			WEIGHT (KGS)
		a	b	c	
80	200	19.0	16.0	3	4.0
100	220	19.0	16.0	3	4.5
150	285	19.0	16.0	3	6.0
200	340	20.0	17.0	3	11.0
250	400	22.0	19.0	3	17.0
300	455	24.5	20.5	4	24.0
350	520	26.5	22.5	4	35.0
400	580	28.0	24.0	4	46.0
450	640	30.0	26.0	4	60.0
500	715	31.5	27.5	4	80.0
600	840	36.0	31.0	5	125.0
700	910	39.5	34.5	5	163.0
800	1025	43.0	38.0	5	264.0
900	1125	46.5	41.5	5	302.0
1000	1255	50.0	45.0	5	350.0



hatchbox

DN (MM)	KEY DIMENSIONS COVER			WEIGHT (KGS)	PRESSURE	
	L	C	D		PFA	PEA
80	800	520	200	65.0	6	6
100	800	535	235	70.0	6	6
150	800	550	300	85.0	6	6
200	800	560	360	98.5	6	6
250	950	675	425	140.0	6	6
300	950	685	485	188.0	6	6
350	950	705	555	252.0	6	6
400	1100	820	620	310.0	6	6
450	1100	820	670	367.0	6	6
500	1200	830	730	422.0	6	6
600	1200	845	845	474.0	6	6



Wall thickness

Pipe

For deviations on pipe see pages 9 and 10.

Fittings

The following table denotes the minimum wall thickness for ductile fittings and the limit deviations as per BS EN545 and BS EN598

DN (MM)	WALL THICKNESS e	LIMIT DEVIATIONS ON NOMINAL WALL THICKNESS ¹
80	7.0	- 2.3
100	7.2	- (2.3 + 0.001 DN)
150	7.8	- (2.3 + 0.001 DN)
200	8.4	- (2.3 + 0.001 DN)
250	9.0	- (2.3 + 0.001 DN)
300	9.6	- (2.3 + 0.001 DN)
350	10.2	- (2.3 + 0.001 DN)
400	10.8	- (2.3 + 0.001 DN)
450	11.4	- (2.3 + 0.001 DN)
500	12.0	- (2.3 + 0.001 DN)
600	13.2	- (2.3 + 0.001 DN)
700	14.4	- (2.3 + 0.001 DN)
800	15.6	- (2.3 + 0.001 DN)
900	16.8	- (2.3 + 0.001 DN)
1000	18.0	- (2.3 + 0.001 DN)

¹ the lower limit only is given to ensure sufficient resistance to internal pressure.

Standardised lengths of push-fit (flexible) pipes

Pipe is supplied in the standardised lengths shown.

DN (MM)	STANDARDISED LENGTH Lu (M)	DEVIATION
80 - 1000	5.5	± 100mm

NB. Of the total number of pipes supplied in each diameter, up to ten percent may be supplied shorter than specified.

Standardised lengths of fittings

Fittings are supplied to the lengths stated within this catalogue. There are two series' of dimensions shown; series A corresponding to ISO 2531 and series B generally limited to DN 450mm. The permissible deviations on the standardised length of series A fittings are given below. No deviation is permitted for series B fittings.

TYPE OF FITTING	DN (MM)	DEVIATION
90° (1/4) Bends	80 - 1000	± (15 + 0.03 DN)
45° (1/8) Bends	80 - 1000	± (10 + 0.025 DN)
22½° (1/16) and 11¼° Bends	80 - 1000	± (10 + 0.02 DN)
Tees	80 - 1000	+ 50/ - 25
Tapers	80 - 1000	± 35
Standard flanged socket pieces	80 - 1000	± 25
Standard flanged spigot pieces	80 - 1000	± 35

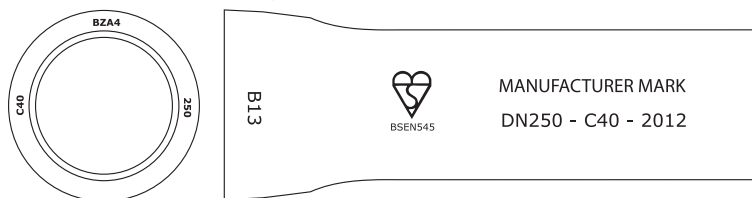


technical

Pipe and fitting markings

Sigma Pipeline Solutions manufactures ductile iron pipe, fittings and accessories to the latest revision of the standard. As part of the standard our pipes, fittings and accessories carry a number of markings for ease of identification.

All pipes and fittings are legibly marked and bear the following information:



For ease of identification and to aid stock rotation we have included additional markings on the pipes. These additional markings are: **month of manufacture** **day of manufacture** **type of cement** **external coatings**

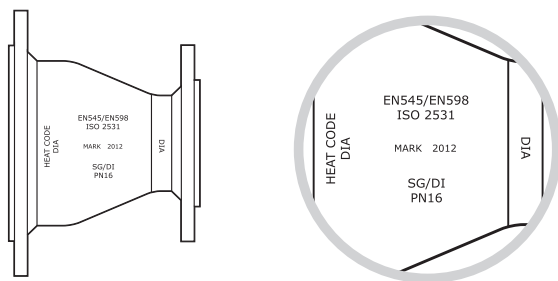
These are marked on both the side of the pipe and on the socket ends.

The following markings are either cast-on or cold stamped as per BS EN545 and BS EN598: **manufacturers mark** **year of manufacture** **identification as ductile iron** **nominal bore** **PN rating if applicable**

All other markings can be applied by any method eg. painted on the casting.

Pipe

Manufacturers name or mark	Mark or name
Year of manufacture	'2012'
Month of manufacture ¹	A,B,C etc
Day of manufacture ¹	A = January, B = February, C = March 13, 14, 15 etc Day of month
Identification as ductile iron	SG or DI
Nominal bore	DN 250
Reference to the standard	BS EN545 or BS EN598
Pipe class	C40 (BS EN545) or PP (BS EN598)
Type of cement	B = Blast furnace cement (BS EN545) H = High Alumina cement (BS EN598) Z = Zinc, A = Aluminium, 4 = 400 g/m ²
External coating	



Cast fittings

Manufacturers name or mark	Mark or name
Year of manufacture	'2012'
Identification as ductile iron	SG or DI
Nominal bore	DN 400
PN rating of flanges for flange components	PN 16
Reference to the standard	BS EN545 or BS EN598
Angle of bend (where required)	90°

standards and bibliography

The table below lists the standards to which we manufacture:

SPECIFICATION	STANDARDS		
	British (BS)	European (EN)	International (ISO)
Quality management systems	BS EN ISO 9001:2008	BS EN ISO 9001	BS EN ISO 9001
Push-fit pipe	BS EN 545 & BS EN 598	BS EN 545 & BS EN 598	ISO 2531
Fabricated (flanged) pipe	BS EN 545 & BS EN 598	BS EN 545 & BS EN 598	ISO 2531
Push-fit fittings	BS EN 545 & BS EN 598	BS EN 545 & BS EN 598	ISO 2531
Flange fittings	BS EN 545 & BS EN 598	BS EN 545 & BS EN 598	ISO 2531
Socket fittings for PVC pipe	BS EN 12841	BS EN 12841	-
Ductile iron pipe: external zinc	BS 8179	-	ISO 8179
Pipe cement mortar	BS EN 197	BS EN 197	ISO 4179
Flanges and their joints	BS EN 1092-2	BS EN 1092-2	BS EN 1092-2
Elastomeric seals (joint gaskets)	BS EN 681-1	BS EN681-1	-
Epoxy coating	BS EN 14901	BS EN 14901	-

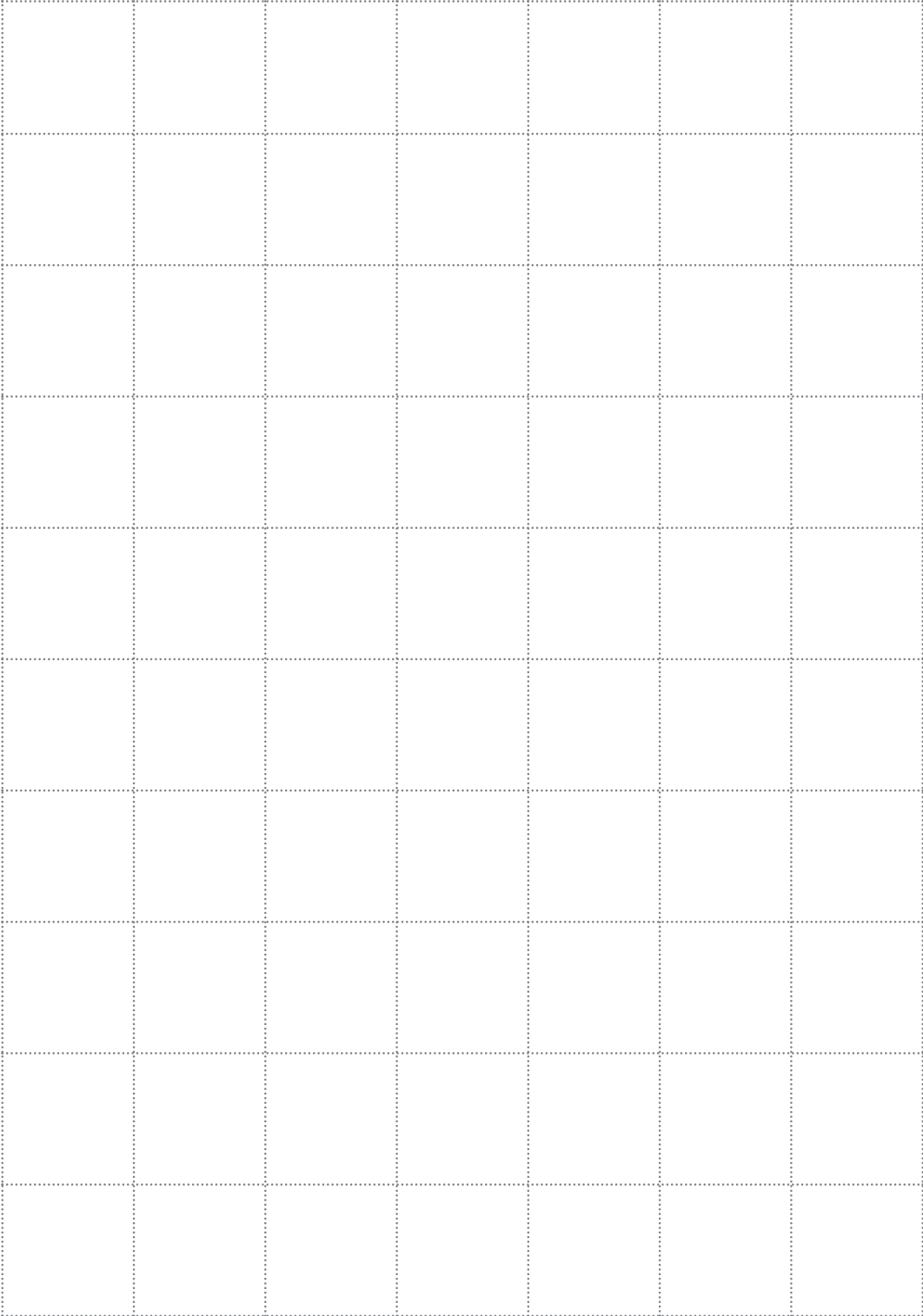
Bibliography

- EN1333** Flanges and their joints – Pipework components – Definition and selection of PN;
- EN1514** Flanges and their joints – Dimensions of gaskets for PD – designated flanges;
- EN14628** Ductile iron pipes, fittings and accessories – External polyethylene coating of pipes – Requirements and test methods;
- EN15190** Ductile iron pipes, fittings and accessories – External polyurethane coating of pipes – Requirements and test methods;
- EN45011** General requirements for bodies operating product certification systems (ISO/IEC Guide 65:1996);
- EN45012** General requirements for bodies operating assessment and certification/registration of quality systems (ISO/IEC Guide 62:1996);
- EN ISO6708** Pipework components – Definition and selection of DN (nominal size) (ISO 6708);
- EEC Directive 98/83/EC** of 03 November 1998, known as “Drinking Water Directive”;
- EEC Directive 89/106/EEC** of 12 December 1989, known as “Construction Products Directive”;
- prEN15542** Ductile iron pipes, fittings and accessories – External cement mortar coating of pipes – Requirements and test methods.



notes

20mm sq. grid





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