

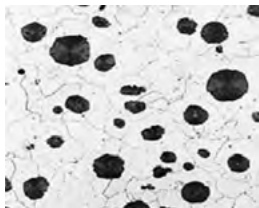
Ductile Iron Pipes And Fittings

United Ductile Industries Sdn Bhd (785316-T) **UDI** was established in 2007 by a strong team of highly experienced technical personnel to provide complete ductile iron pipe system complying with BS EN 545:2010 for waterworks and BS EN 598:2007 +A1:2009 for sewerage sector.

UDI strive to provide products and services of the highest quality and the greatest possible value to our customer, thereby gaining and holding their respect and loyalty.

WHAT IS DUCTILE IRON

Ductile Iron not only retains all of cast iron's attractive qualities such as machinal property and corrosion resistance, but also provides additional strength, toughness and ductility. Although its chemical properties are similar to those of cast iron, Ductile Iron incorporates significant casting refinements, additional metallurgical processes and superior quality control.



DUCTILE IRON

Ductile Iron also differs from cast iron in that its graphite form is spheroidal, or nodular, instead of the flake form found in cast iron. Thus, Ductile Iron is also referred to as nodular iron or spheroidal graphite iron.

This change in graphite form is accomplished by adding an nodularizer, usually Magnesium, to molten iron of proper composition.



CAST IRON

Chemical Composition of Ductile Iron

	Carbon	Manganese	Silicon	Phosphate	Magnesium	Sulphur
Max	3.40%	0.50%	2.80%	0.06%	0.05%	0.04%
Min.	3.30%	0.10%	2.20%	0.03%	0.03%	0.02%

Mechanical Properties

Tensile Strength	420 N/mm ² min.
Elongation	10% min. (Pipes ≤ DN1000) 7% min. (Pipes ≥ DN1100)
Hardness	230HB max.
Hazen-Williams Value	140

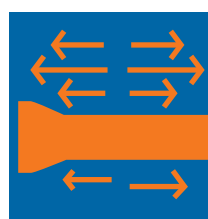
Physical Properties

Specific Gravity	7.15
Thermal Expansion Coefficient	12.3 x 10 ⁻⁶ cm/cm/°C
Thermal Conductivity	36 W/m°C
Elastic Coefficient	1.7 x 10 ⁴ kg/mm ²
Poisson's Ratio	0.28

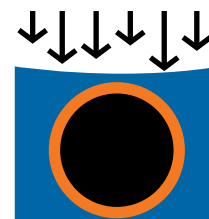
Maximum Design Stresses

Tension	170 N/mm ² min.
Compression	180 N/mm ² min.
Shear	150 N/mm ² min.
Bending	
(i) Circumferential (pipe wall)	250 N/mm ² min.
(ii) Longitudinal (pipe as beam)	200 N/mm ² min.

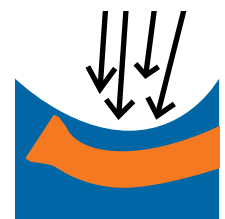
ADVANTAGES & BENEFITS of DUCTILE IRON PIPES



Superb Tensile Strength



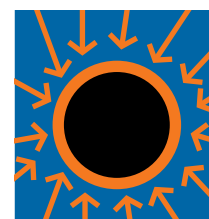
Withstands Severe Crushing Loads



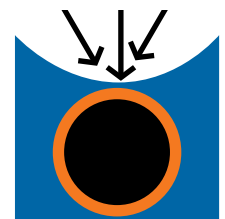
Great Beam Strength



Tremendous Bursting Strength



Corrosion Resistant



High Impact Resistant



Ease of Installation



Maintenance Free

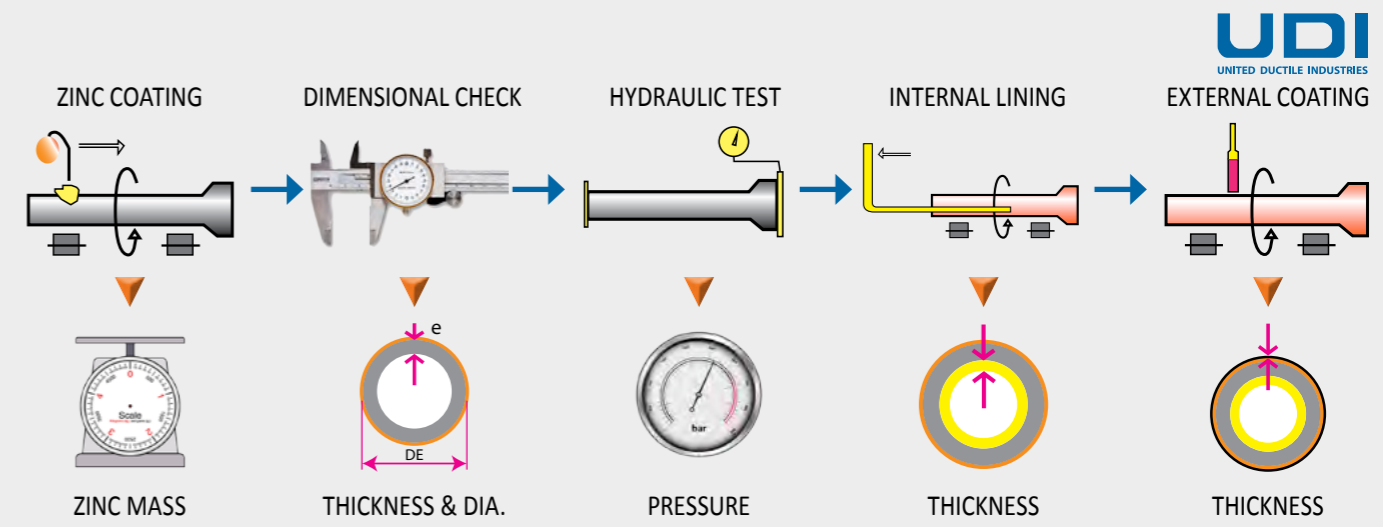
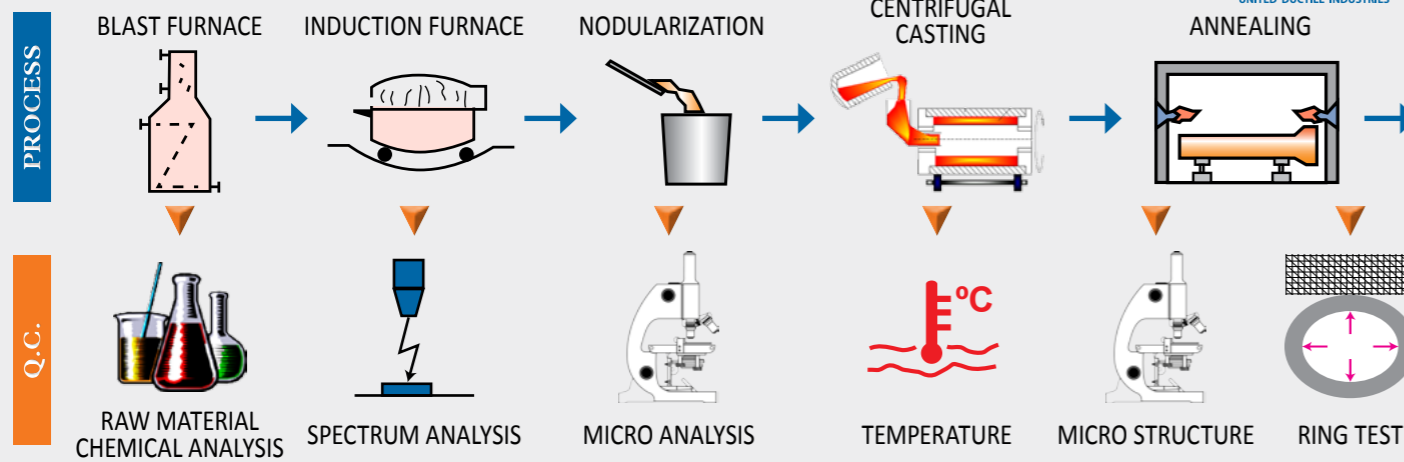


Impressive Energy Saving

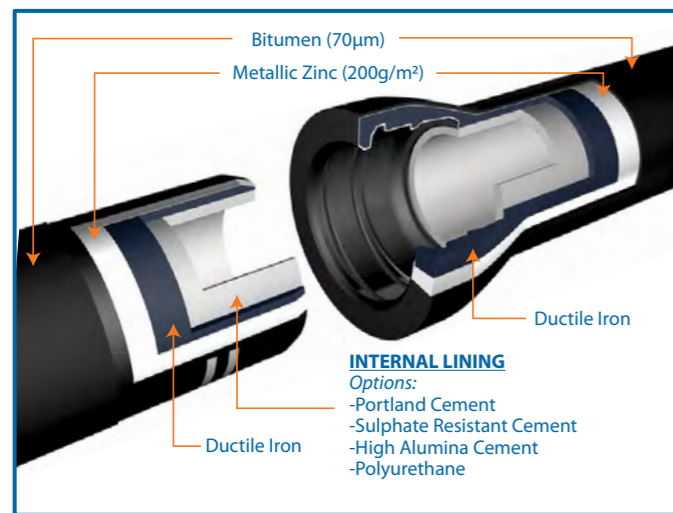
With its tremendous strength and durability, Ductile Iron Pipe is recognised as the superior pipe material for water supply and pressure sewage application all over the world.

It can be installed with confidence that actual service conditions, now and in the future, will not compromise its ability to perform.

PROCESS & QUALITY CONTROL



DUCTILE IRON PIPE PROTECTION SYSTEM



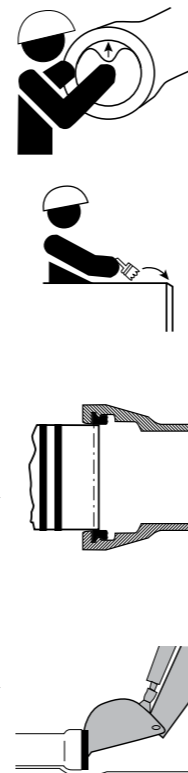
INSTALLATION OF SOCKETED JOINT

Thoroughly clean the spigot, interior of the socket and rubber ring. Ensure that the spigot is properly chamfered. Looping the rubber ring in the initial insertion will facilitate its bedding into the seating groove.

Apply a thin layer of lubricant to the inside surface of the rubber ring and also to the outside surface of the spigot. Avoid foreign particles adhere onto the lubricated surfaces and cause a leak.

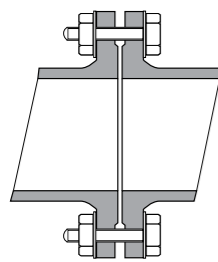
The spigot of the pipe should be aligned and carefully entered into the socket until it just makes contact with the rubber ring. Joint assembly is completed by forcing the spigot of the pipe past the gasket (which is thereby compressed) until contact is made with the bottom of the socket.

Note that the first stripe is not visible and the second stripe approximately flush with the socket. A feeler gauge can be used to verify position of the rubber ring when inserted into the assembled joint. Joint deflection may be achieved after the pipe is fully inserted.

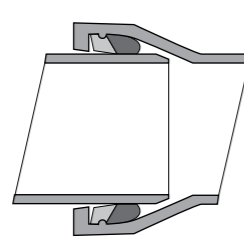


TYPE OF PIPE JOINTS

FLANGED



SOCKETED



Application

For use above ground, in water and sewage treatment works, pumping stations etc.

Characteristics

Rigid, self anchoring joints that provide easy installation and removal of valves, hydrant etc. Due to the risk of excessive bending moments being imposed, it is recommended that flanged pipework is NOT buried.

Application

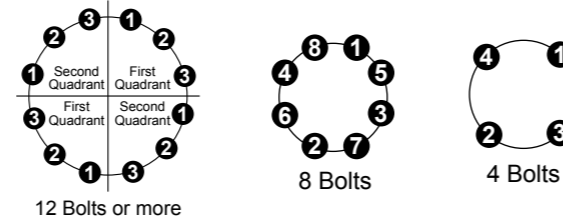
For use below ground, e.g. water and pressure sewage pipelines.

Characteristics

Flexible joint allowing some angular deflection and longitudinal withdrawal.

INSTALLATION OF FLANGED JOINT

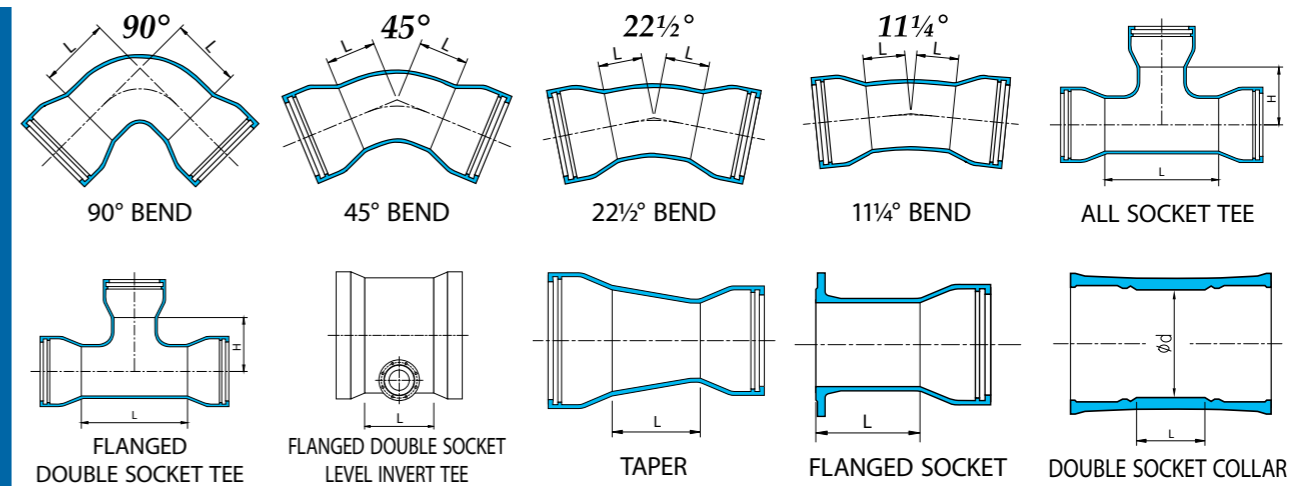
Bolt should be tightened in the correct sequence and a sufficient number of circuits undertaken to ensure that the appropriate bolt torques are achieved. It must be noted on flanged joints using elastomeric gaskets some relaxation of the gasket will experienced and it should be ascertained that the bolting torques required to effect a seal at the appropriate pressure are effective at the time of pressure testing.



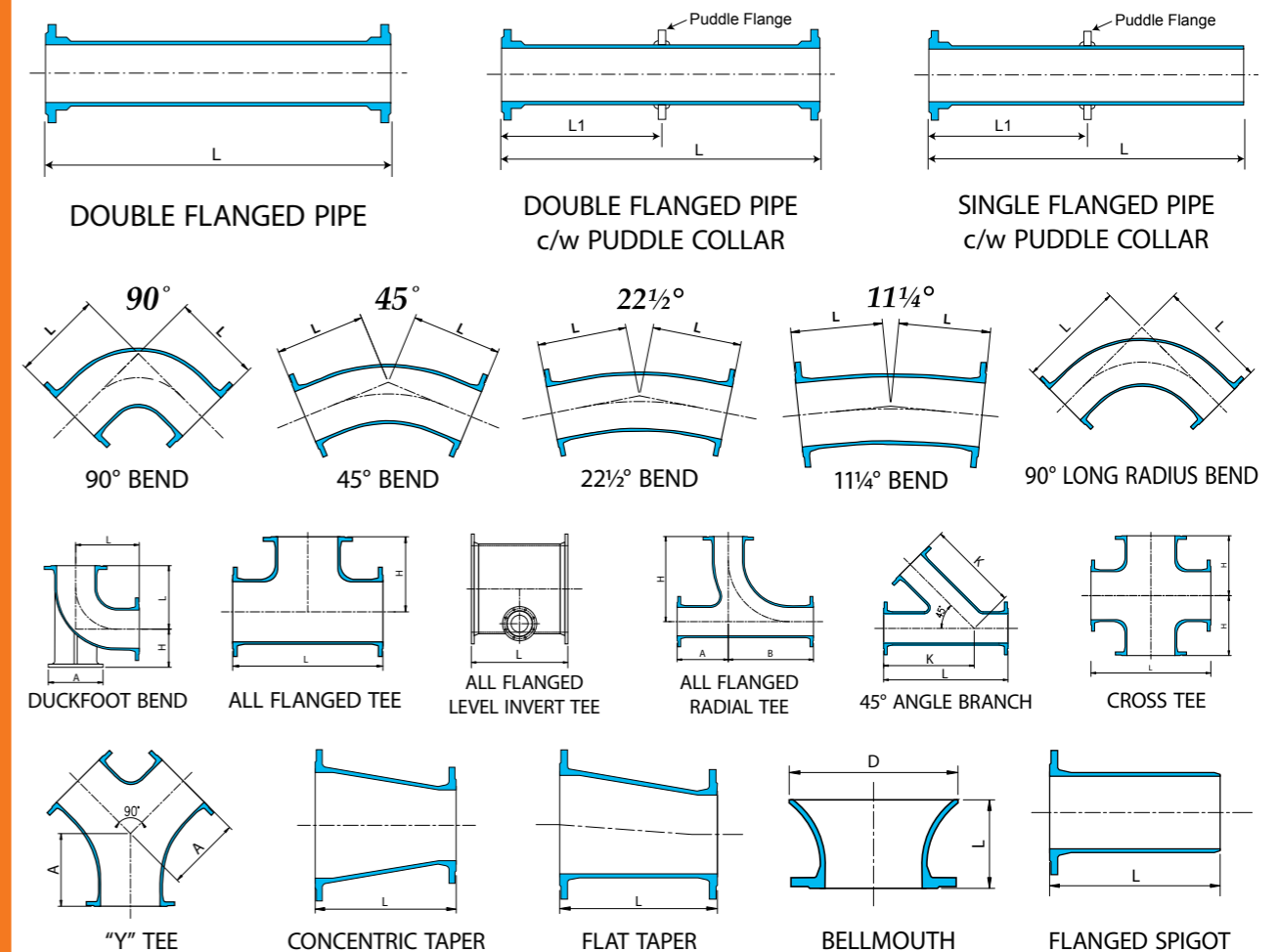
For sizes having 12 bolts or more, it is recommended that two jointers work simultaneously on diametrically opposite bolts. Each joint tightens the first nut in the first quadrant, then the first nut in the second quadrant, returns to the second nut in the first quadrant and so on.

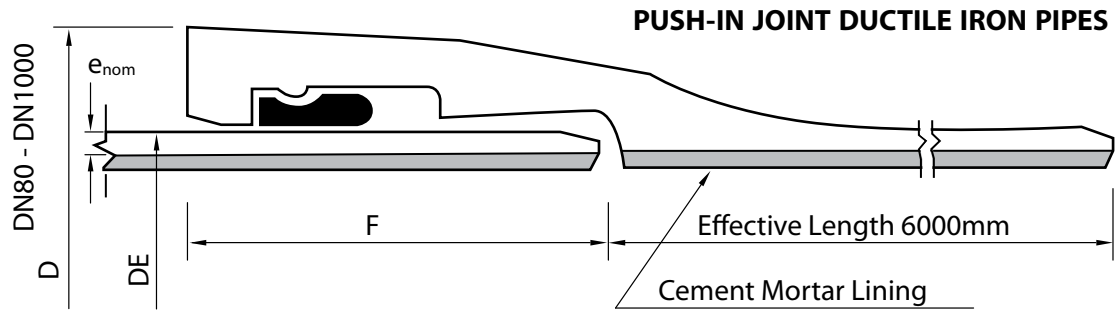
DUCTILE IRON FITTINGS & SPECIALS

SOCKETED



FLANGED





DN	External Diameter		Dimensions of Socket		Nominal iron wall thickness, e_{nom}						
	Nominal DE	Limit Deviations			BS EN 545:2010					BS EN 598:2007 +A1:2009 Pressure Pipe	
			D	F	C25	C30	C40	C50	C64		C100
80	98	+1/-2.7	140	85			4.4	4.4	4.4	4.8	4.8
100	118	+1/-2.8	163	88			4.4	4.4	4.4	5.5	4.8
150	170	+1/-2.9	217	94			4.5	4.5	5.3	7.4	4.8
200	222	+1/-3.0	278	100			4.7	5.4	6.5	9.2	4.9
250	274	+1/-3.1	336	105			5.5	6.4	7.8	11.1	5.3
300	326	+1/-3.3	393	110			6.2	7.4	8.9	12.9	5.6
350	378	+1/-3.4	448	110		6.3	7.1	8.4	10.2	14.8	6.0
400	429	+1/-3.5	500	110		6.5	7.8	9.3	11.3	16.5	6.3
450	480	+1/-3.6	552	120		6.9	8.6	10.3	12.6	18.4	6.7
500	532	+1/-3.8	604	120		7.5	9.3	11.2	13.7	20.2	7.0
600	635	+1/-4.0	713	120		8.7	10.9	13.1	16.1	23.8	7.7
700	738	+1/-4.3	824	150	8.8	9.9	12.4	15.0	18.5		9.6
800	842	+1/-4.5	943	160	9.6	11.1	14.0	16.9	21.0		10.4
900	945	+1/-4.8	1052	175	10.6	12.3	15.5	18.8			11.2
1000	1048	+1/-5.0	1158	185	11.6	13.4	17.1	20.7			12.0

Outside Diameter of commonly used pipe materials

Nominal Size		Ductile Iron	Mild Steel		Asbestos Cement		uPVC	ABS	HDPE	HYPRO PVC-O
Inch	mm	BS EN 545 / 598	JKR Spec	BS 534	MS 712 Class B	MS 712 Class C	MS628/ BS 3505	MS1419/ BS5391	MS1058/ ISO4427	ISO16422
3	80	98		88.9		95.5	88.9	88.9	75	90
4	100	118	121.9	114.3		121.9	114.3	114.3	110	110
6	150	170	177.3	168.3		177.3	168.3	168.3	160	160
8	200	222	232.2	219.1		232.2	219.1	219.1	200	200
10	250	274	286	273		286	273	250	250	250
12	300	326	345.4	323.9	339.9	345.4	323.9	315	315	315
14	350	378	399.3	355.6		399.3	355.6	355	355	
16	400	429	453.1	406.4		453.2	406.4	400	400	400
18	450	480	506.9	457	492.4	506.9	457	450	450	
20	500	532	560.3	508		560.3	508	500	500	500
24	600	635	667	610	650.5	667	610			630
28	700	738	754	711				710	710	
32	800	842	854	813				825.5	800	
36	900	945	954	914					900	
40	1000	1048	1054	1016					1000	

* All Dimensions are in millimetre (mm).