

PRODUCTOS Y SOLUCIONES
EN REDES DE FLUIDOS

PRODUCTS AND SOLUTIONS
IN FLOW SYSTEMS

TUBERIA DE FUNDICIÓN
DUCTILE IRON PIPES

 **Fondon**
global

Qué ofrecemos

Las empresas que conforman Fondón Global cuentan con más de 35 años de experiencia en el campo de las redes de fluidos, especialmente en los sectores minero, petrolero, químico, aguas, energético, cementero, papeler, alimentario y siderúrgico.

Nuestra oferta abarca desde el diseño y fabricación de válvulas standard y especiales, la venta de productos de marca propia o de fabricantes líderes en sus mercados, integración de suministros, hasta contratos de llave en mano para proyectos de ingeniería en automatización industrial. Esta estructura ofrece el aval, desde hace años, de las certificaciones de calidad ISO 9001.

Modelo de Negocio

El modelo de negocio de Fondón Global se edifica sobre cuatro sólidos pilares, a partir de los cuales ofrecemos soluciones globales adaptadas a las necesidades de cada cliente:



Diseño

La división de diseño de equipos para control de fluidos, localizada en la empresa FCA, permite generar soluciones a medida para válvulas especiales del tipo guillotina, dampers, válvulas de chorro hueco, mariposa, retención, compuertas y otros equipos hidromecánicos.

La división de ingeniería en automatización industrial, localizada en Fondón Redes y Fluidos, desarrolla proyectos con cualquier protocolo de comunicación. Contamos con dilatada experiencia en el protocolo FF (FieldBus Foundation).

Fabricación

Las instalaciones de FCA sirven de sede a la gestión de los centros productivos de válvulas especiales. Desde ésta se gestiona una red de centros que producen los diferentes equipos.

What we offer

The companies comprising Fondón Global have more than 35 years experience in the field of industrial plumbing and pipeline services, specialising in mining development, oil companies, the chemical, water, energy, cement, paper and food industries and the iron and steel sector.

We offer services ranging from the design and manufacture of standard and specialised valves, the sale of our own brand products, or of leading market brands, full service supply capability, to turnkey contracts for engineering projects in industrial automation. The structure we offer gives the security of having been guaranteed for years by the ISO 9001 certificate of quality.

Business Model

The Fondon Global business model is based on four solid pillars from which we offer global solutions adapted to each client's needs:

Design

The department for the design of equipment for fluid control, found in FCA company, allows us to generate tailor made solutions for special valves such as knife gate, dampers, fixed cone, butterfly, check and gate valves along with other hydro mechanical equipment.

Our industrial automation engineering department, found in Fondón Redes y Fluidos, develops projects using all communication protocols. We have extensive experience with FF protocol (FieldBus Foundation).

Manufacture

The FCA premises is the base for the management and organisation of the production centres for specialised valves from which a network of centres dedicated to producing the equipment are controlled.

Representación

Fondon Global aporta a sus clientes una amplia gama de marcas y soluciones de fabricantes líderes o de gran prestigio en el mercado, así como una línea propia de calidad avalada.

Comercialización

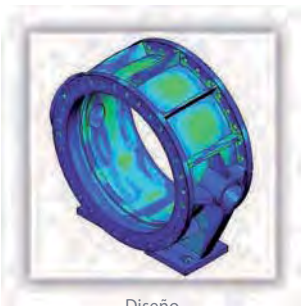
Entendemos que la agilidad y la excelencia en el servicio son básicas para nuestro desarrollo futuro. En consecuencia, contamos con las mejores herramientas en aras de una eficiente gestión comercial con nuestros clientes, a través de sistemas ERP y gestores de conocimiento que nos permiten identificar cada día mejor las necesidades de nuestros clientes.

Representation

Fondon Global offers its clients a wide range of brands and solutions from leading manufacturers and prestigious companies as well as our own quality guaranteed products.

Marketing

We understand that agility and excellence in the services we offer are basic for our future development. As a consequence we use the best systems available in order to achieve efficient marketing management with our clients, through ERP systems and knowledge management which allow us to improve, day by day, in the identification of the needs of our clients.



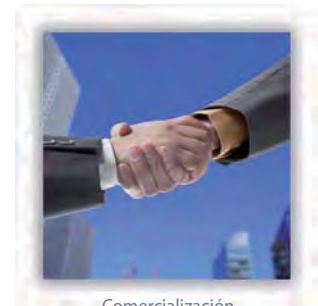
Diseño
Design



Fabricación
Manufacturing



Representación
Representation



Comercialización
Marketing

Nuestra Misión

La transparencia y proximidad al cliente han sido siempre nuestras premisas. Sobre ellas se construye nuestra estrategia: "Ser referencia en la fabricación y prestación de servicios tecnológicos en el sector de la automatización industrial y redes de fluidos en especial en países emergentes, principalmente en el mercado latinoamericano, siendo al mismo tiempo conscientes de nuestra responsabilidad en el progreso de los países donde desarrollamos nuestra actividad."

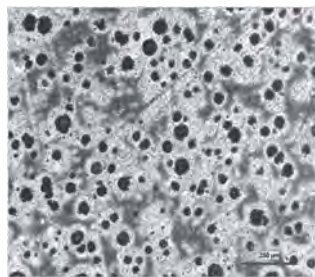
Our Mission

Transparency and proximity to our clients have always been our watchwords on which we have built our strategy "To be a point of reference in manufacturing and technological services in the industrial automation sector and pipelines mainly in developing countries, particularly in Latin American markets, whilst being conscious of our responsibility for progress in the countries where we operate"



Ductil Iron Pipes *Product Materials*

Ductile iron is produced by treating molten low-sulfur base iron with magnesium under closed controlled conditions. In ductile iron, the graphite exists in the form of spheroidal shape, which has little influence on weakening the matrix and resulting in centralizing strain, so ductile iron possesses good flexible property. While, in grey iron, the graphite is present in flake form, which has the effect of cutting the iron matrix and making it become brittle and easy to crack.



Ductile Iron Metallography



Grey Iron Metallography

Remarkable Mechanical Properties

The mechanical properties of ductile iron are markedly superior to those of grey iron and approaching the properties of steel. Ductile iron possesses the nature of iron and properties of steel. The much improved properties were recognized to be of particular benefit in the centrifugal pipe industry and as such most of the pipe production now in ductile iron.

	Ductile Iron Pipe	Grey Cast Iron Pipe	Steel Pipe
Tensile Strength (N/mm ²)	Min. 420	150~260	Min. 400
Elongation (%)	DN80~1000≥10 DN1200~2600≥7	Negligible	Min. 18
Module of Elasticity (N/mm ²)	Approx. 17×10 ⁴	Approx. 11×10 ⁴	Approx. 16×10 ⁴
Hardness (HB)	Max. 230	Max. 230	Approx. 140

Documents relevant to earthquakes show that the damage rate per kilometer for ductile iron pipe mains is one quarter if that for grey iron and one thirteenth of some other materials of pipes.

Pipe Material	Damage Rate per Kilometer of Main Pipeline in Earthquake
Ductile Iron	0.04
Grey Iron	0.17
Other Materials	0.17~1.24

Advantages of Ductile Iron Pipe

- Ductile iron pipe possesses excellent mechanical properties. It has the tensile strength, yield strength and module of elasticity that are comparable with steel pipe.
- Ductile iron pipe has high corrosion resistance. Ductile iron pipes are lined with cement or resins, and coated with bitumen paints, which solves the problems of internal and external corrosion that grey iron pipes and steel pipes can not solve. Therefore, the users don't have to take any anti-corrosive measures. It also prevents secondary pollution to the water quality.
- The joints are flexible and have good adaptability. The connections of ductile iron pipes are push-on joints or gland mechanical joints with rubber gaskets, and have good leak tightness and ductility. No welding is required. The designed deflection is 3~5 °, so the number of fittings required can be reduced. The joints can absorb the stress caused by foundation settlement and prevent pipe rupture.
- Easy to assembly. Ductile iron pipe installation is convenient and not subject to weather conditions. The installation does not need sophisticated equipments and workers do not have to be highly professional.
- The pipes satisfy the highest hygienic standards. Drinking water and ground water are protected by pipe walls which seal against diffusion. The pipes are resistant to extremely high internal pressure.
- The service time is up to 50 years, with the material properties unaffected.
- High load-bearing capacity.
- Ductile iron pipes are environmentally-friendly. Pipes are sustainable and recyclable, and the materials used are inorganic.
- Both deep and shallow top covers are possible. The pipes are suitable for all soils and laying methods, and
- Economic advantages.
 - No need for change of soils or additional bedding for the pipes, and the soils excavated can be re-used.
 - Major savings of time and money, because the soil excavated does not have to be taken away.

Specifications

Standard Wall Thickness

Nominal wall thickness of pipes:

$$e=K (0.5+0.001*DN)$$

Where, DN: Nominal diameter; K: Coefficient (K=7, 8, 9, 10, 11, 12...)

Nominal wall thickness of pipe fittings:

$$e=7+0.014*DN \quad (K=14)$$

$$e=6+0.012*DN \quad (K=12)$$

Nominal Diameter	Wall Thickness (mm)					
	Pipe				Fittings	
DN	K8	K9	K10	K12	K12	K14
80	6.0	6.0			7.0	8.1
100		6.1			7.2	8.4
150		6.3			7.8	9.1
200		6.4			8.4	9.8
250		6.8	7.5	9.0	9.0	10.5
300	6.4	7.2	8.0	9.6	9.6	11.2
350	6.8	7.7	8.5	10.2	10.2	11.9
400	7.2	8.1	9.0	10.8	10.8	12.6
450	7.6	8.6	9.5	11.4	11.4	13.3
500	8.0	9.0	10.0	12.0	12.0	14.0
600	8.8	9.9	11.0	13.2	13.2	15.4
700	9.6	10.8	12.0	14.4	14.4	16.8
800	10.4	11.7	13.0	15.6	15.6	18.2
900	11.2	12.6	14.0	16.8	16.8	19.6
1000	12.0	13.5	15.0	18.0	18.0	21.0
1200	13.6	15.3	17.0	20.4	22.8	23.8

Works Hydraulic Test Pressure

Nominal Diameter	Works Test Pressure (bar)					
	Pipe (K9)	Fittings	Pipes With Weld-on or Screwed-on Flange			
			PN10	PN16	PN25	PN40
DN						
80 to 300	50	25	16	25	32	40
350 to 600	40	16				
700 to 1000	32	10				
1100 to 2000	25	10				

Mechanical Properties

Item	Tensile Strength N/mm ²	Elongation %		Proof Stress N/mm ²		Hardness HB
	DN80 TO DN2600	DN80 TO DN1000	DN1100 TO DN2000	DN80 TO DN1000	DN1100 TO DN2000	
Pipe	≥420	≥ 10	≥7	≥270	≥ 300	≤230
Fittings	≥420	≥5		≥300		≤250

* Proof stress shall be measured upon agreement only.

Chemical analysis

Metallographic test

Mechanical
performance test

Samples

Standard Lining and Coating

Internal Lining

Internal Lining	Pipe & Fittings
Standard Coating	Blast furnace cement mortar
Reinforced Protections	High alumina cement mortar
Special Coatings	Please consult us

External Coating

External Coating	Pipe & Fittings
Standard Coating	Metallic zinc + Bituminous paint
Reinforced Protections	Polyethylene sleeve applied
Special Coatings	Polyurethane or polyethylene coating

* Other types of coating or lining may be applied upon request.



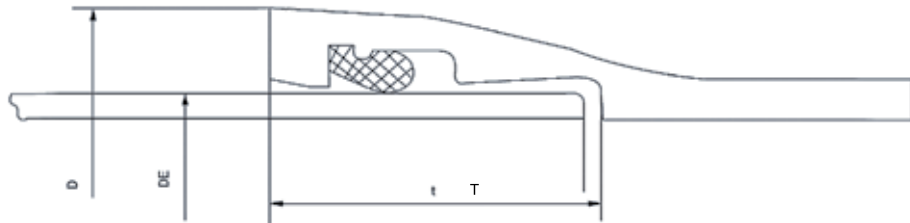
Dimensions of Push-on Joint T Type Ductile Iron Pipe K9

DN (mm)	DE (mm)	Wall Thickness (mm)	Approximate Weight of Socket (kg)	Weight of Straight Section (kg/m)	Weight of Each Unit (kg/6m)
Nominal Diameter	Outside Diameter				
80	98	6.0	3.4	12.2	77
100	118	6.1	4.3	15.1	95
150	170	6.3	7.1	22.8	144
200	222	6.4	10.3	30.6	194
250	274	6.8	14.2	40.2	255
300	326	7.2	18.6	50.8	323
350	378	7.7	23.7	63.2	403
400	429	8.1	29.3	75.5	482
450	480	8.6	38.3	89.7	577
500	532	9.0	42.8	104.3	669
600	635	9.9	59.3	137.3	883
700	738	10.8	79.1	173.9	1123
800	842	11.7	102.6	215.2	1394
900	945	12.6	129.0	260.2	1690
1000	1048	13.5	161.3	309.3	2017
1100	1152	14.4	194.7	362.8	2372
1200	1255	15.3	237.3	420.1	2758
1400	1462	17.1	385.8	547.2	3669
1600	1668	18.9	375.4	690.3	4517

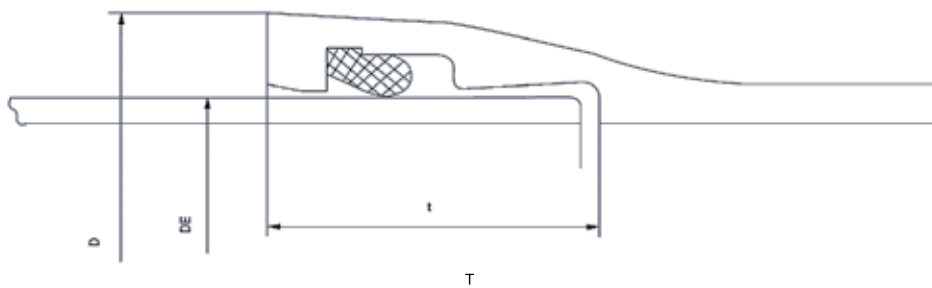
* Any other questions, please feel free to consult us.

Push-on Joint Type

DN80-DN1400



DN1600-DN2000

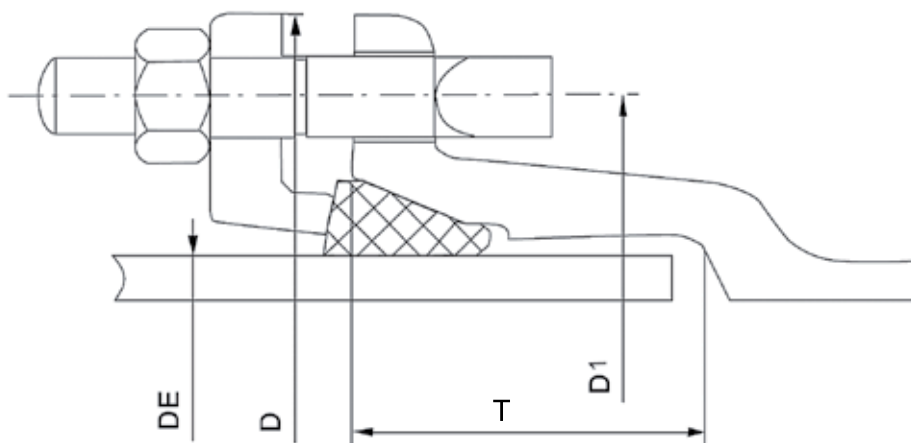


>DN2000 on request

Nominal Diameter DN	mm		
	DE	D	T
80	98	142	84
100	118	163	88
150	170	217	94
200	222	278	100
250	274	336	105
300	326	393	110
350	378	448	110
400	429	500	110
500	532	604	120
600	635	713	120
700	738	824	150
800	842	943	160
900	945	1052	175
1000	1048	1158	185
1200	1255	1377	215
1400	1462	1632	239
1600	1668	1850	265
1800	1875	2049	275
2000	2082	2231	285

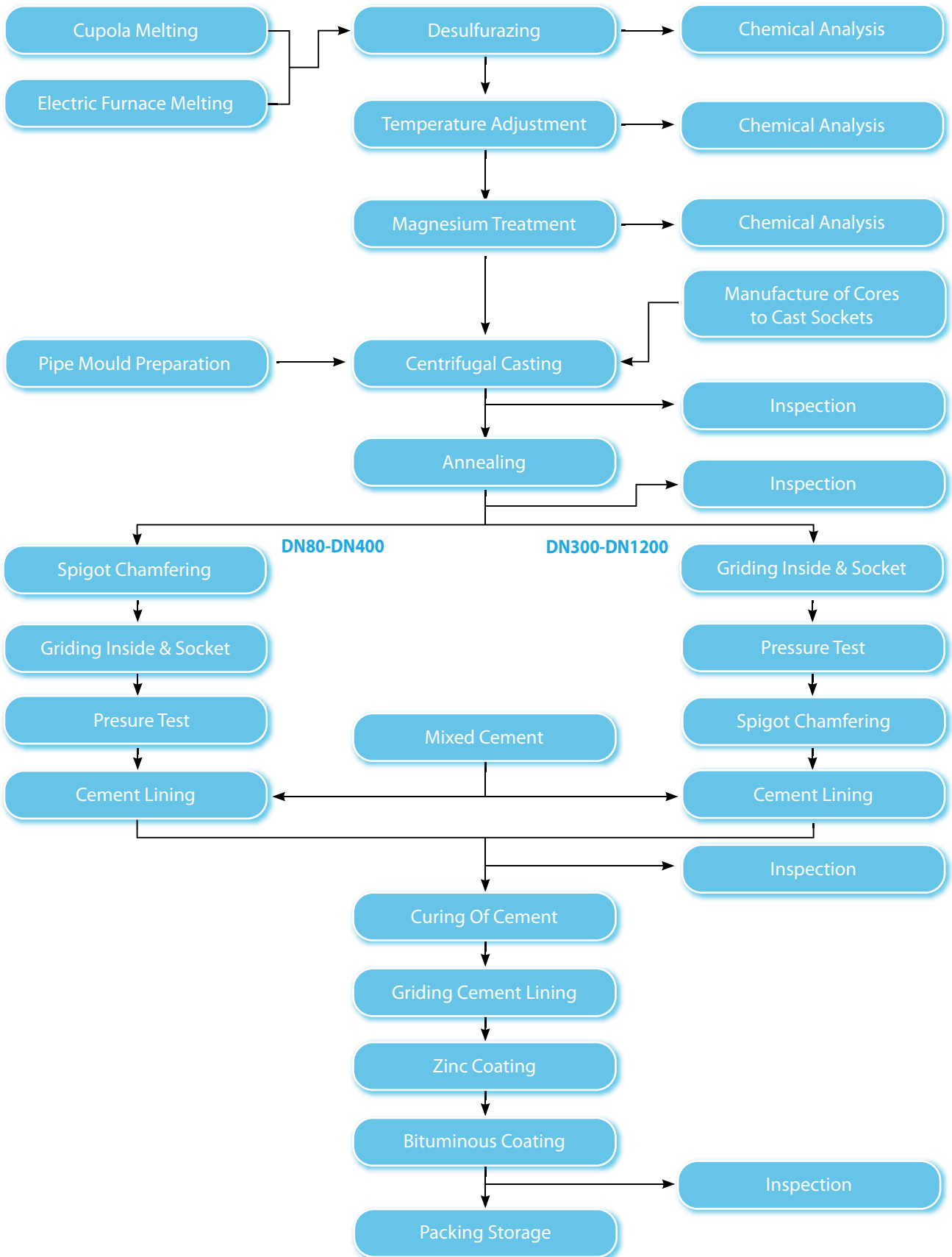
For higher dimensions, please contact our sales engineers, as we try these cases as customized projects.

Mechanical Joint K Type



Nominal Diameter DN	mm				Holes No.
	DE	D1	D	T	
100	118	186	232	80	4
150	170	241	287	80	6
200	222	292	338	80	6
250	274	348	394	80	8
300	326	399	445	110	8
350	378	458	504	110	10
400	429	512	558	110	12
500	532	618	664	110	14
600	635	725	771	110	14
700	738	839	893	120	16
800	842	942	996	120	20
900	945	1052	1118	120	20
1000	1048	1160	1226	130	20
1200	1255	1372	1438	130	28
1400	1462	1591	1657	130	28
1600	1668	1790	1856	160	30
1800	1675	1996	2062	170	34
2000	2082	2216	2282	180	36

Product Flow Chart



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IN FLOW SYSTEMS



Diseño
Design



Fabricación
Manufacturing



Representación
Representation



Comercialización
Marketing

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