

中国·河南  
HENAN·CHINA

安钢集团永通球墨铸铁管有限责任公司  
Angang Group Yongtong Ductile Cast Iron Pipe Co.,Ltd.



永通铸管  
YONGTONG PIPE



同心聚进 缔造恒远

Striving together, thriving forever



倡导绿色革命 保护地球家园

YONGTONGZHUGUAN



永通铸管

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# 安 | 阳 | 钢 | 铁 | 集 | 团 | 有 | 限 | 责 | 任 | 公 | 司

安阳钢铁集团有限责任公司始建于1958年，现已成为集采矿选矿、炼焦烧结、钢铁冶炼、轧钢及机械加工、冶金建筑、科研开发、信息技术、物流运输、国际贸易、房地产等产业于一体，可生产中厚板、热轧和冷轧卷板、高速线材、型钢、球墨铸管等30多个品种、2000余个规格的钢铁产品及化工产品，年产钢能力近1000万吨的现代化钢铁集团，河南省最大的精品板材和优质建材生产基地。

安钢先后获得全国实施卓越绩效模式先进企业、全国质量管理先进企业、全国优秀企业金马奖、国家标准化良好行为4A企业、中国诚信企业质量奖、全国质量奖、河南省突出贡献企业、河南省功勋企业等多项荣誉称号。

Anyang Iron & Steel Group Co., Ltd. (Hereinafter ANGANG) was established in 1958. Since reform and opening, ANGANG creates an excellent record of continuously making profit for 30 years and becomes one of the super modern steel enterprises in China, whose annual production are ten million tons. In 2008, the sales reached more than 50 billion yuan per year. Now ANGANG's business fields include mining, coking, smelting, mechanical machining, metallurgical construction, transport and trading, it can produce more than 30 kinds of different iron and steel products with about 2000 sizes and specifications including Middle thick plate, Coil plate, High speed wire rod, Reinforced bar, Round bar, Angel, Channel and Ductile iron pipes etc... In recent years ANGANG has been granted the honored titles for many times in China. ANGANG is dedicated to sustainable development, so as to seek the harmony between human and nature.







永通铸管  
YONGTONG PIPE



安钢集团永通球墨铸铁管有限责任公司  
Angang Group Yongtong Ductile Cast Iron Pipe Co., Ltd.



YONGTONG DUCTILE PIPES



永通铸管  
YONGTONG PIPE



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YONGTONG DUCTILE PIPES



安钢集团永通球墨铸铁管有限责任公司是安钢集团的控股子公司。2005年12月30日由安钢集团下属的水冶钢铁有限责任公司和永通球墨铸铁管有限责任公司重组成立。

永通铸管公司是中国河南铸造生铁生产基地。年产150万吨。公司所生产的生铁具有性脆、低碳、低硫等特点。曾被中国冶金工业部评为部优产品。99年通过了ISO9001质量管理体系认证。产品广泛应用于国内大型精密铸造企业，并远销美洲、欧洲、亚洲等十多个国家和地区。在日本被誉为免检产品。

永通铸管公司生产工艺先进、技术力量雄厚、检验设备齐全。产品质量一流。以本公司的优质球墨铸造用生铁为原料，拥有先进的60米长蓄热式退火炉。年可生产DN80-DN1200mm球墨铸铁管60万吨。接口型式有T型、K型和自锚式等。内防腐有水泥砂浆、环氧树脂。外防腐有喷锌+喷沥青漆、喷锌+喷塑。产品广泛应用于输水等领域。公司有专业的研发队伍，有足够的研发能力，可满足不同用户需求。

永通铸管公司是中国建筑金属结构协会认定的球墨铸铁管定点生产企业。公司严格按照国际标准组织生产，先后通过了SGS机构ISO9001国际质量管理体系认证、EN545、EN598的产品质量认证、ISO2531、ISO4179、ISO8179、ISO7186产品质量认证、国家钢铁产品质量监督检验中心的冶金产品质量认证、职业健康安全、环保双标认证（即ISO14001以及GB/T28001-2004体系认证），符合饮用水卫生标准，获得省卫生厅颁发的卫生许可证批件。是河南省免检产品、中国知名铸管产品十佳品牌。“永通”牌球墨铸铁管是中国城镇供水排水协会首家推荐产品。

本公司产品畅销海内外，先后出口欧洲、非洲、亚洲、北美洲的一些国家，受到客户的一致好评，诚邀国内外宾朋与永通合作，携手共创美好未来。

Angang Group Yongtong Ductile Cast Iron Pipe Co., Ltd. is one of subsidiaries of the large state-owned enterprise, Anyang Iron & Steel Group Co., Ltd. aged of 57 years. As a modern factory of high start, high standard and high quality, it possesses the first level production lines with capacity of 600,000 tons. BN80-BN1200mm annual production for ductile iron pipe with T and Self-restrained joint. At present, we can supply pipe with many kinds coating inside and outside, including cement, zinc, bitumen, epoxy, epoxy ceramic, PE, polyurethane, FBE and so on, which are widely used to supply and drain water system.

The pig iron for Yongtong Pipe is produced by the same company and it has features of low P, low S, low Ti, etc. These kind of pig iron is widely used in domestic and foreign for its excellent. The production line adopts advanced process, especially using 60m annealing furnace for ensuring the pipe's mechanical property and easy selection for test wall thickness of each pipe. We organize production standards strictly according to international standard. Our management system has been assessed and certified by SGS as meeting the requirements of ISO9001 and Yongtong pipe has been certified by SGS satisfying the requirements of ISO2531, EN545, and EN598. Etc. of pipe inside conform to ISO4179 and coating outside accord with ISO8179. What is more, ISO7186, BS6920 and other certificates we have gotten.

Through indefatigable effort, we self-developed Jacking Pipe with the characteristics of non excavation, and Yongtong pipe has been exported to countries and areas of Middle East, Europe, Central and Southern America, Southeast Asia, Africa and so on.

There are lots of qualified managers and technicians, and a well-trained team of after-sales service, which provides all services of manufacture, package, transportation and installation. The staff will face to the future, devoting themselves to the pipeline system and benefiting mankind.





ISO9001:2000质量体系认证证书

ISO 9001:2000 certificate on quality system issued by SGS

ISO2531产品认证证书

ISO2531 Production Certificate issued by SGS

BS EN598产品认证证书

BS EN598 production certificate issued by SGS

BS EN545产品认证证书

BS EN545 production certificate issued by SGS

BS6920 卫生安全认证证书

BS 6920 Certificate on water portable issued by WRAS

ISO14001环境管理体系认证证书

ISO 14001:2004 Environment management system certificate

GB/T28001 职业健康安全管理体系认证证书

GB/T2008 Occupational health and safety management system certificate

中华人民共和国特种设备制造许可证

Special equipment manufacturing license of the People's Republic of China

国家科学技术成果鉴定证书

National scientific and technical achievement appraisal certificate

河南省卫生厅许可批件

Healthy approved document from the health bureau of Henan province

国家钢铁产品质量检验中心检测报告

Inspection report from steel iron product quality supervision and inspection center

中国城镇供水协会推荐产品

Recommended products certificate from CWSA

冶金产品实物质量认定证书金杯奖

Metallurgical products quality certificate gold award

河南省建设新产品新技术推广证书

New product new technology popularization certificate of the construction in Henan province

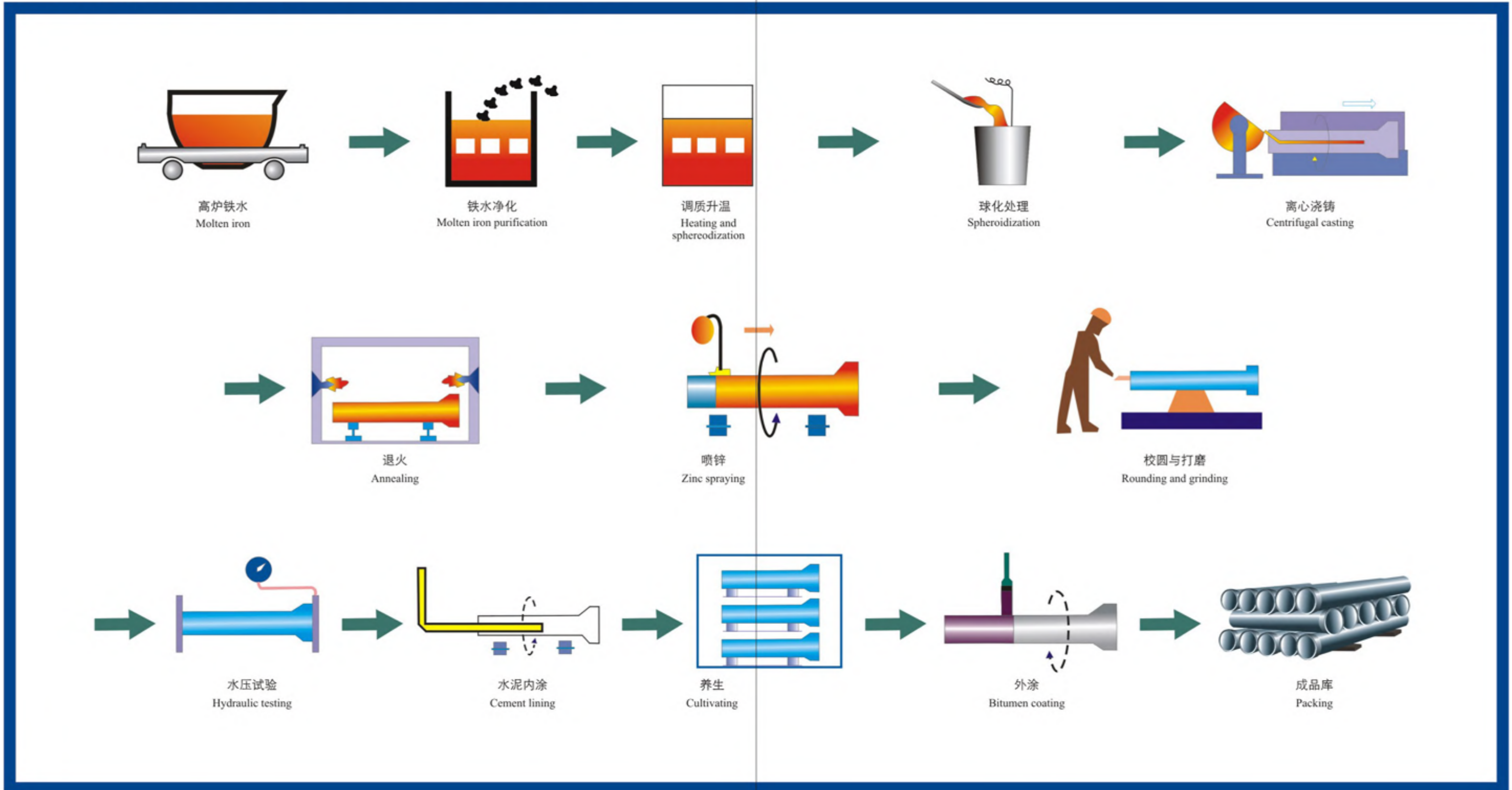
- 产品生产执行ISO2531/BSEN545/GB13295标准
- 质量管理体系通过SGS的ISO9001:2000 认证
- 产品实物通过SGS的 ISO2531/BS EN545 认证
- 卫生安全通过WRAS的 BS6920认证
- 环境管理体系通过ISO14001:2004认证
- 每支管子都严格进行水压试验
- Pipes be produced according to ISO2531/BSEN545/GB13295 standard
- Be granted ISO9001:2000 certificate for quality system
- Be granted ISO2531/BS EN545 production certificates issued by SGS
- Be granted BS6920 certificate for portable water issued by WRAS
- Be granted ISO14001:2004 Environment management system certificate
- Each pipe be carried out hydraulic pressure test strictly





# 球墨铸铁管生产工艺流程

Production process flow of ductile cast iron pipes







高炉炼铁 Blast furnace



拔管过程 Pipe extracting



60米退火炉  
60m annealing furnace



电炉升温及调质 Heating and spheroidization in induction furnace



离心浇铸 Centrifugal casting





沥青喷涂 Bitumen coating



喷锌处理 Zinc spraying



水压试验 Hydraulic pressure testing



水泥衬层 Cement lining



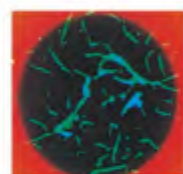
终检 Final inspection



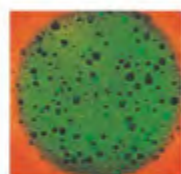
## 质量控制

## Quality control

球墨铸铁是铸铁的一种，是一种铁、碳和硅的合金。球墨铸铁中石墨是以球状形式存在的，一般石墨的大小为6~7级，质量上要求铸管的球化等级控制为1~3级（球化率 $\geq 80\%$ ），因而材料本身的机械性能得到了较好的改善，具有铁的本质，钢的性能。退火后的球墨铸铁管，其金相组织为铁素体加少量珠光体，机械性能较好。



灰铸铁金相  
Grey iron



球墨铸铁金相  
Ductile cast iron



金相检验 Metallographic examination

Ductile cast iron is a kind alloy of iron, carbon and silicon, in which graphite exists in the type of spherical, generally the size of graphite is 6~7 class, and spheroidization grade of the pipe should be controlled 1~3 class (spheroidization rate is not below 80%). Thus after spheroidization, ductile cast iron possesses the nature of iron as well as the characteristics of steel. After annealing, its microstructure contains ferrite and a little pearlite possessing excellent mechanical properties.



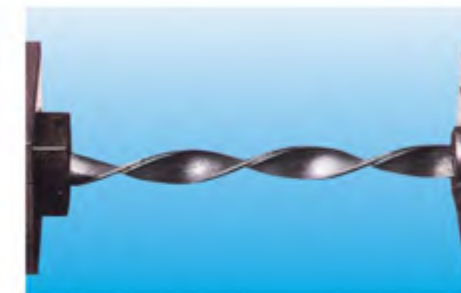
快速分析 Fast analysis

## Quality control

## 质量控制



压环试验 Hardness test



扭曲试验 Twist test



压扁试验 Flat-pressing test



拉伸试验 Elongation test



破坏性试验 Damage test

	离心球墨铸铁管 Ductile cast iron pipe	普通灰铁管 Grey iron pipe	钢管 Steel pipe
抗拉强度 (Mpe) Tensile strength	$\geq 420$	150—260	$\geq 400$
屈服强度 (Mpe) Yield strength	$\geq 300$	未定义 No confirmation	未定义 No confirmation
抗弯强度 (Mpe) Bending strength	$\geq 590$	200—360	$\geq 400$
延伸率 (%) Elongation	$\geq 10$	忽略 Neglected	$\geq 18$
布氏硬度 (HBS) Brinell hardness	$\leq 230$	$\leq 230$	约140

退火后球墨铸铁管，其金相组织为铁素体加少量珠光体，机械性能较好。  
After annealing, the microstructure of ductile cast iron pipes is ferrite and a little pearlite, possessing excellent mechanical properties.



型式试验 Type test



## 在线检测

## Test on line

\* 永通球墨铸铁管有限责任公司对所生产的球墨铸管进行严格的在线检测，检测项目有水压试验压力、水泥内衬厚度、喷锌厚度、沥青厚度，以及尺寸检验和压痕检验等。公司拥有国际先进的 $\gamma$ 射线在线壁厚检测仪，对每支管子的壁厚进行精确测量，确保质量符合ISO2531标准。

球墨铸管的水压试验压力如下表：

The hydraulic test pressure of the ductile cast iron pipes is as follows:

公称直径DN (mm) Nominal diameter	水压试验压力 (Mpa) Hydraulic test pressure
80≤DN≤300	5
350≤DN≤600	4
700≤DN≤1000	3.2
1100≤DN≤2000	2.5

球墨铸管的水泥内衬厚度如下表：

The thickness of cement lining is as follows:

公称直径DN (mm) Nominal diameter	最小厚度 (mm) Minimum wall thickness
80≤DN≤300	3
350≤DN≤600	5
700≤DN≤1000	6

During production process, we carry out tests on line strictly and test items includes: hydraulic pressure, cement lining thickness, zinc spraying thickness, bitumen coating thickness, dimension test, impressing test and so on. Especially, we have the most advanced  $\gamma$ -ray detector to test wall thickness of each pipe precisely so that we could ensure pipes quality conform to ISO2531 standard.



水压试验 Hydraulic pressure test



尺寸检验 Dimension test



压痕检验 Impressing test

## Antiseptic treatment

## 防腐处理



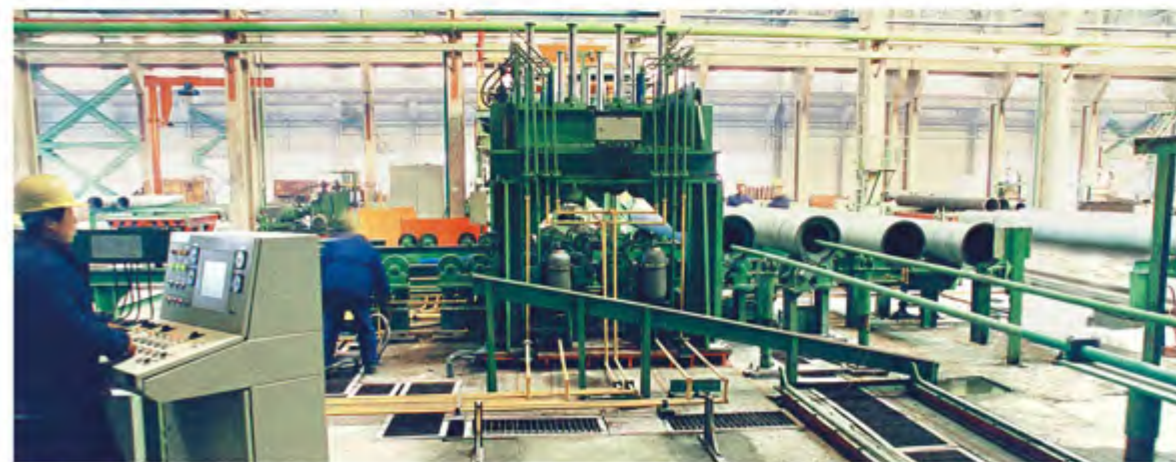
喷锌 Zinc spraying



喷沥青 Bitumen coating

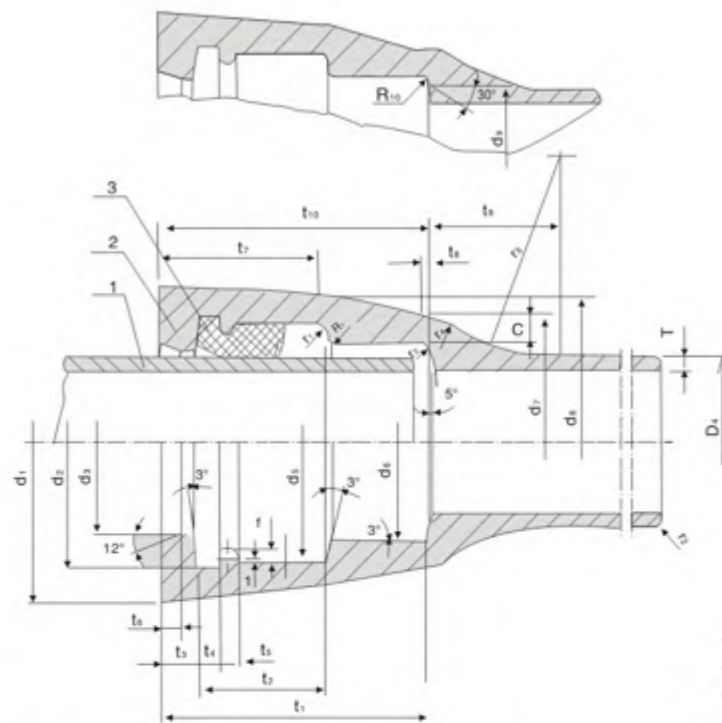
公司对所生产的球墨铸管按照国际标准进行防腐处理。内衬水泥质量符合ISO4179标准，保证砂浆坚固密实、光滑、附着力强；外部喷锌、涂沥青质量符合ISO8179标准，每平方米管道最小喷锌量为130g，沥青漆厚度不低于70微米。

We adopt preservative treatment for all pipes according to International standard. Internal cement lining conforms to ISO4179 standard and the cement mortar is firm, dense, smooth and it has strong adhesion. External zinc spraying( $\geq 130g/m^2$ ) and bitumen coating ( $\geq 70\mu m$ ) conform to ISO8179 standard.



水泥衬层 Cement lining





T型接口  
1 插口; 2 承口; 3 胶圈  
T type joint  
1.Spigot 2.Socket 3.Rubber ring

T型接口球铁管重量 (ISO2531 / GB/T13295-2013标准)

Weight of ductile cast iron pipes with T type joint (ISO2531 / GB/T13295-2013标准)

公称直径 DN(mm)	外径(mm) External Diameter (mm)	承口近似 重量 (Kg) Socket Weight(Kg)	直部每米重量 (Kg/m) Unit Weight (Kg/m)				总重量 (Kg) 工作长度=6000mm Total weight (kg) length =6000mm				总重量 (Kg) 工作长度=5700mm Total weight (kg) length =5700mm				
			K8	K9	K10	C Class	K8	K9	K10	C Class	K8	K9	K10	C Class	
Size(mm)															
80	98	3.4	12.2	12.2	12.2	C40	9.10	77	77	77	58	73	73	73	55
100	118	4.3	14.9	15.1	15.1	C40	11.12	93.7	95	95	71	90	91	90	68
150	170	7.1	21.8	22.8	22.8	C40	16.48	138	144	144	106	132	138	137	101
200	222	10.3	28.7	30.6	30.6	C40	22.62	183	194	194	146	174	185	185	139
250	274	14.2	35.6	40.2	44.3	C40	32.63	228	255	280	210	218	244	267	200
300	326	18.6	45.3	50.8	56.3	C30	43.90	290	323	357	282	278	309	340	269
350	378	23.7	55.9	63.2	69.6	C30	51.88	359	403	441	335	343	384	420	319
400	429	29.3	67.3	75.5	83.7	C30	60.78	433	482	532	394	414	460	506	376
450	480	32.2	80	89	99	C30	73.30	515	575	632	472	492	550	597	450
500	532	42.8	92.8	104.3	115.6	C30	87.20	600	669	736	566	572	638	702	540
600	635	59.3	122	137.3	152	C30	120.62	791	882	971	783	755	842	926	747
700	738	79.1	155	173.9	193	C25	142.15	1009	1123	1237	932	963	1071	1179	889
800	842	102.6	192	215.2	239	C25	177.07	1255	1394	1537	1165	1197	1330	1465	1112
900	945	129.9	232	260.2	289	C25	197.68	1521	1691	1863	1446	1452	1613	1777	1257
1000	1048	161.3	275	309.3	343.2	C25	266.28	1811	2017	2221	1759	1729	1925	2118	1679
1200	1265	237.7	374	420.1	466.1	C25	373.88	2482	2758	3034	2481	2370	2632	2894	2369

## 顶管

### Jacking pipes

能承担较大的顶力，具有足够的强度，可承受内、外压力；具有良好的耐腐蚀性、耐久性；具有一定的柔性，可吸收地面位移。

This kind of pipe is able to bear huge jacking pressure. As well owns enough intensity to endure internal and external pressure. It also possesses perfect characteristic of anti-corrosion and durability. In addition, the inherent flexibility enables it to adapt ground displacement.

自主研发的顶管，填补了球墨铸铁管顶管的空白。

Self-developed product fills the gap of pipe jacking.





## 自锚管

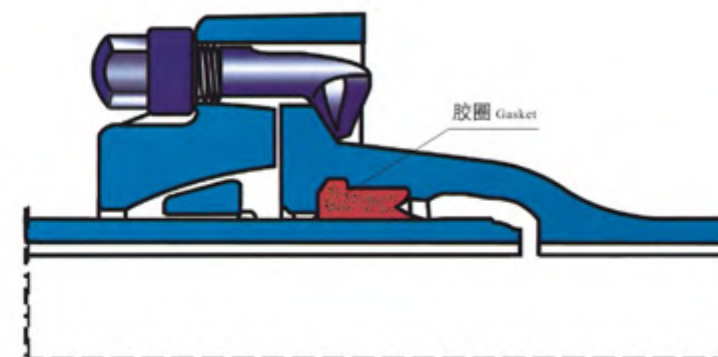
### Self-Restrained joint pipes

同时具备柔性连接和刚性连接的特点，接口的防拔脱性能好，适用于地形复杂的地区及坡度土壤，对管道内水压造成的地基不均匀沉降有一定的适应性。

With the characteristics of flexible connection and rigid connection at the same time. The joint has excellent anti-extract performance, which especially suit for varied topography and plot slop, and has some adaptation for asymmetric foundation settlement results from inner pressure of pipeline.



自锚式接口球墨铸铁管  
Ductile cast iron pipe for self-restrained Joint



自锚接口 Self-restrained Joint pipe

### 自锚球铁管重量参数表

#### Weight list of self-restrained joint pipe

公称直径 DN(mm)	外径(mm) External Diameter (mm)	承口近似重量 (Kg) Socket Weight(Kg)	直部每米重量 (Kg/m) Unit Weight (Kg/m)				总重量 (Kg) 工作长度=6000mm Total weight (kg) length =6000mm				
			K8	K9	K10	C Class	K8	K9	K10	C Class	
Size(mm)						Class	Kg/m				Kg
80	98	3.7	12.2	12.2	12.2	C40	9.10	76.8	76.8	76.8	58.30
100	118	4.7	14.9	15.1	15.1	C40	11.12	94.1	95.4	95.4	71.42
150	170	8.5	21.8	22.8	22.8	C40	16.48	139.4	145.4	145.4	107.38
200	222	10.9	28.7	30.6	30.6	C40	22.62	183.6	194.6	194.6	146.62
250	274	15	35.6	40.2	44.3	C40	32.63	228.8	255.8	280.8	210.78
300	326	22.2	45.3	50.8	56.3	C30	43.90	293.3	326.3	360.3	285.60
350	378	26.5	55.9	63.2	69.6	C30	51.88	361.8	405.8	443.8	337.78
400	429	32.5	80	75.5	83.7	C30	60.78	436	485	535	397.18
450	480	41.6	80	89	99	C30	73.30	521.6	575.6	635.6	481.40
500	532	50.6	92.8	104.3	115.6	C30	87.20	607.8	676.8	743.8	573.80
600	635	71.9	122	137.3	152	C30	120.62	803.6	894.6	983.6	795.62
700	738	85.3	155	173.9	193	C25	142.15	1015.2	1129.2	1243.2	938.20
800	842	108.7	192	215.2	239	C25	177.07	1261.1	1400.1	1543.1	1171.12
900	945	140.1	232	260.2	289	C25	197.68	1532.1	1701.1	1874.1	1326.18
1000	1048	174.3	275	309.3	343.2	C25	266.28	1824	2030	2234	1771.98
1200	1265	267.5	374	420.1	466.1	C25	373.88	2511.8	2787.8	3063.8	2510.78





## 压力排污管

### Compressive-Sewage Pipes Supplying

安钢永通铸管依托多年积累的技术研发优势、强大的制造能力和完善的质量管理体系，通过了EN598、ISO7186认证，严格按照ISO7186标准生产压力排污球墨铸铁管，产品规格为DN80-DN1200。

Relying on advanced research technology, strong production capacity, and perfect quality control system, Yongtong company has been awarded EN598 as well as ISO7186 certificates. The sewage pipe is produced strictly according to ISO7186 standard. And the size contains DN80mm-DN1200mm.

### 永通压力排污管壁厚

#### Wall thickness of compressive-sewage pipes

公称直径 DN (mm)	外径 DE (mm)	公称壁厚 T (mm)
80	98	4.4
100	118	4.4
125	144	4.5
150	170	4.5
200	222	4.7
250	274	5.5
300	326	6.2
350	378	6.3
400	429	6.5
450	480	6.9
500	532	7.5
600	635	8.7
700	738	8.8
800	842	9.6
900	945	10.6
1000	1048	11.6
1100	1152	12.6
1200	1255	13.6



## 内防腐

### Internal anticorrosion performance

根据不同的输送介质和用户要求提供高铝水泥内衬、硅酸盐水泥内衬、抗硫水泥内衬、环氧树脂内衬和环氧陶瓷内衬等多种内防腐。

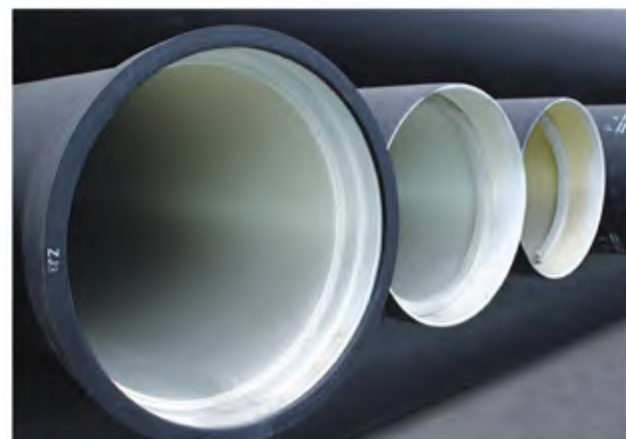
According to different aquatic medium and customer's requirements, we can supply High-Aluminum cement, Portland cement, Sulphate-Resistance cement, epoxy resin, epoxy ceramic for inside lining.



内衬高铝水泥  
High-Aluminum cement lining inside



内衬红色、黄色环氧树脂漆  
Red, Yellow epoxy paint inside



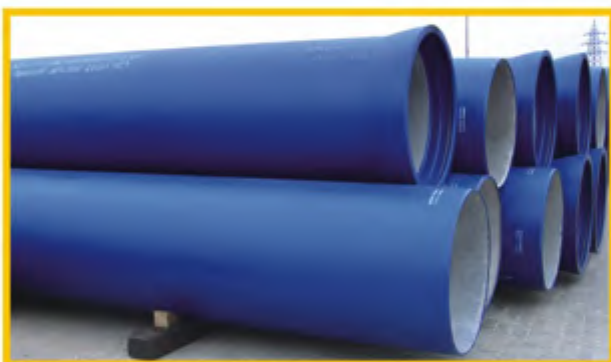


## 外防腐

### External anticorrosion performance

永通铸管外部防腐层为：锌+铁红色环氧漆；  
可根据土壤特性和用户需求提供外喷聚氨酯、环氧树脂等多种特殊防腐层。

External anticorrosion performance:  
Besides Zinc and epoxy standard treatment, we also supplies many kinds of special coating consist of polyurethane and polyethylene according to clients' requirements.



外衬天酞蓝高氯化乙烯 Blue HCPE coating outside



外衬铁红色环氧漆 Red epoxy paint outside

## 管件和胶圈

### Fittings and rubber rings

#### 管件

采用真空消失模铸造工艺装备生产的球墨铸铁管配套管件，严格按照国际标准ISO2531及BS EN545组织生产和检验，产品规格为DN80--DN2400，年生产能力1.2万吨。

#### Fittings

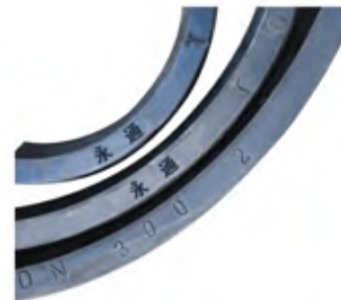
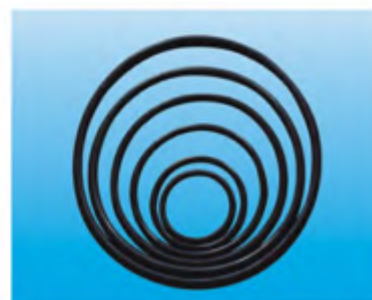
We supply DN80mm- DN2400mm with the capacity of 12000 MT. Which is produced strictly according to ISO2531 and BS EN545 standard by using advanced EPC process.

#### 胶圈

橡胶密封圈严格按照国际标准ISO4633组织生产和检验，通过了ISO9001质量体系认证，产品规格为DN80--DN1400。

#### Rubber rings

Rubber ring are produced strictly according to ISO4633 standard. And we have been awarded ISO9001 certificate. Products ranging, DN80mm--DN1400mm.







## 球墨铸铁管的吊装与运输

### 吊装

吊运管子要小心，不要让管子晃动，吊运管子可用钢丝绳、吊装带及专用吊索具，使用钢丝绳时不许用单根，为保护管子外防腐层，可用橡胶皮或类似的材料将钢丝绳包起来。使用吊钩时，为保护水泥衬层不受破坏，也要将吊钩用橡胶皮或类似材料包起来，特别是在吊运大口径管子时，应在吊钩上装一个与管子内径形状相似的垫块。吊运成捆的管子时，不许将吊钩固定在捆装用钢带上或管子的承插口端。

### Hoisting

Take precaution of handling pipe with steel cable, hoisting belts and specialized rigging avoiding from pipe's rocking. While using steel cable, single cable is not admitted, for the purpose of protecting outer anti-corrosion layer, steel cable should be packed by rubber or other similar material. While using hook, it also should be covered with rubber or other similar material for protecting cement lining layer. Especially for pipe with relative large diameter, hook should be mounted a gasket with same shape as internal diameter of pipes while handling. It is not available fixing hook on the steel belts or socket side and spigot side of pipe while handling pipes in bundle.



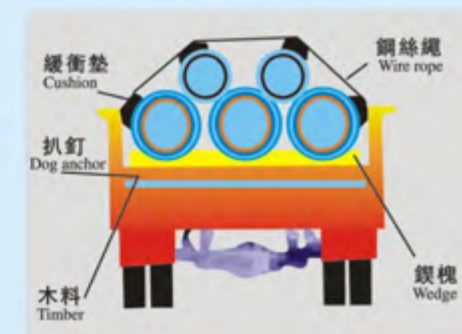
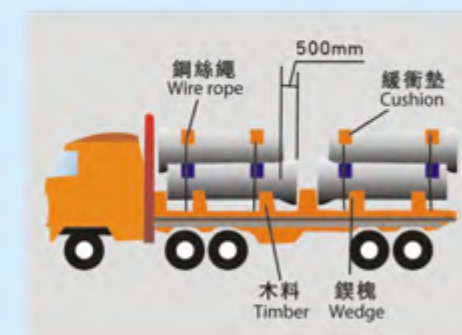
## Handling and transportation of ductile cast iron pipes

### 运输

用汽车运输管子时，应在汽车平台上放两块或更多木料，管子置于木料上用楔块固定。管子伸出车体外部分不得超过管长的1/4。所装管子多于一层时，每一层都要倒转管子方向，两层管子中间应加缓冲胶垫或垫木。最后用钢丝绳加缓冲垫固定牢靠。在搬运过程中要经常检查管子有无掉落的风险，检查止动楔块是否松动，遇不平的道路或急转弯时要慢行。

### Transportation

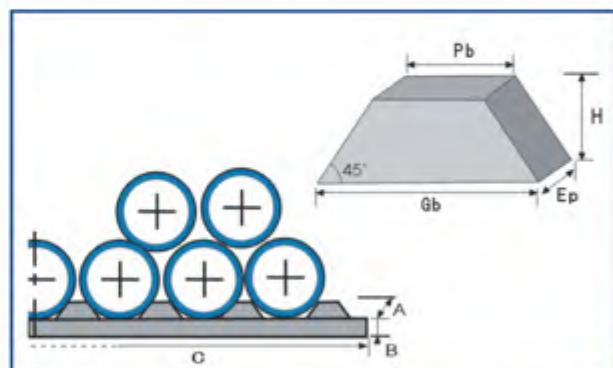
Put two pieces or more woods on the platform of the vehicle while transporting, pipes are laid on the wood and fixed by wedge. The part over the vehicle body should not be more than 1/4 of overall length of pipe. If pipes are piled up more than one layer, each layer of pipes should reverse, and buffering rubber or gasket should be put on the space between two layers of pipes, at last pipes are fixed up with steel cable and buffering gasket. Check often if pipes can fall out during conveying, and check if stop wedge is not hard up. The vehicle should slow down on the uneven road or while swerving.





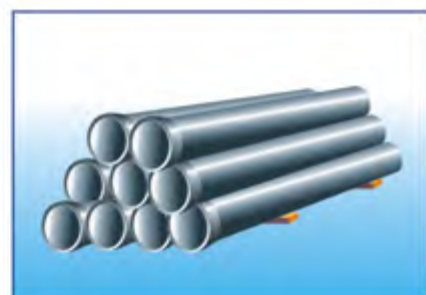
## 堆放

堆放管子时，在管子下部应垫上枕木或垫块，管子的承插口相互交错，必须放止动楔块以防管子滚动。不允许堆放在沼泽地、不平整、斜坡或污染严重的地方。



## Storage

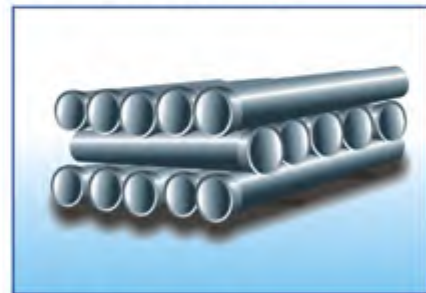
Under pipes there should be put wedge or crosstie while stacking pipes, and socket and spigot of pipes should be interleaved and on the stop wedge in cast of pipe's rolling. Uneven and serious polluted ground, or slope and marshy are not available.



夹板堆放 Plywood storage



少量堆放 Less pipes storage



四方形堆放 Rectangle storage

允许堆放层数应符合下表要求:

Layer number should accord with following table:

	100	150	200	250	300	350	400	500
标准式 Standard type	27	22	18	16	14	12	11	10
金字塔式 Pyramid stacking	58	40	31	25	21	18	16	14
	600	700	800	900	1000	1200		
标准式 Standard type	8	7	5	2	2	2		
金字塔式 Pyramid stacking	12	10	7					

## 球墨铸铁管的安装

### Assembly of ductile cast iron pipe

1、开沟前，首先清除障碍，挖掘管沟时，应当考虑将来回填时，土砂能够充分地回填至管底部位。

挖掘接口处的沟槽时，为了接口操作容易，应尽量留有余地，必须保证接口操作能够充分用上力气。

除了特殊情况之外，管沟边线应是一条直线，沟底应在一平面，用机械挖沟时，槽底应留0.2-0.3m厚的土层暂不开挖，最后应当用人工清理沟底至标高。

2、挖掘管沟尺寸(不用钢板桩时)。(见图a及对应表格)

3、用毛刷和干净的抹布清理承口内部，特别是放橡胶密封圈的位置。不要留有漆、土、砂子等残物。清扫插口，光滑边缘。(见图1)

4、对DN100~300mm小口径球铁管如图所示，将折叠起的密封圈插入到承口中，使密封圈的硬制动垫块紧紧地嵌入到底座中；压密封圈的凸起处，直到密封圈均匀地稳固在承口内；对DN400mm以上的球铁管，将密封圈弯曲两处，然后轮流向外按两个凸起处，这样将密封圈插入其底座就容易些。制动垫块的内缘不能从承口制动处伸出。按右图检查密封圈是否正确。(见图2-1、图2-2、图2-3)

1. Before the ditch is dug, obstacles on the digging area should be cleared away.

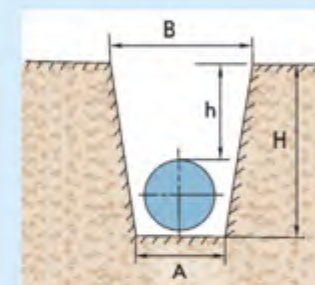
Ensuring that the soil can be backfilled sufficiently to the area below the pipes for the future backfill should be taken into account. More space of the ditch should be kept at pipe joints in order to operate easily.

Except for special situation, the verge of the ditch should be a straight line and the bed should be on the same level. When dug by mechanical method, 0.2-0.3m soil layer should be remained for manual operating.

2. Dimensions of the ditch (without steel plate stage). (see figure a and the corresponding table)

3. Using a wire brush and a clean rag, carefully clean the inside of the socket particularly the gasket recesses. In particular, remove any deposits of earth, sand, etc. also clean the spigot of the pipe to be jointed and the gasket itself, get smooth edge. (See figure 1)

4. For ductile cast iron pipe typed DN100~300mm, insert folded gasket into the socket end to make brake facing block embed tightly in the base. Press the protrude of gasket till the gasket fixed evenly in the socket. For pipe typed above DN400mm, bend two ends of the gasket, then press two protrudes outwards one by one, thus more easily insert the gasket into the base. The internal face of brake facing block can't be extend from the brake of the socket. Check the gasket proper or not in respect of the right figure. (See fig2-1, fig2-2, fig2-3)



图a

挖掘管沟尺寸表 Dimension table of the ditch

口径mm	A(m)	B(m)	h(m)	H(m)
75	0.50	0.76	1.20	1.29
100	0.50	0.76	1.20	1.32
150	0.50	0.76	1.20	1.37
200	0.60	0.88	1.20	1.42
250	0.60	0.89	1.20	1.47
300	0.60	0.90	1.20	1.52
350	0.70	1.01	1.20	1.57
400	0.80	1.15	1.30	1.73
500	1.10	1.47	1.30	1.83
600	1.30	1.73	1.50	2.13
700	1.50	1.95	1.50	2.23
800	1.70	2.17	1.50	2.34
900	1.90	2.39	1.50	2.44

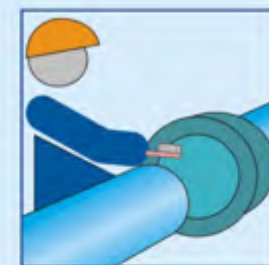


图1

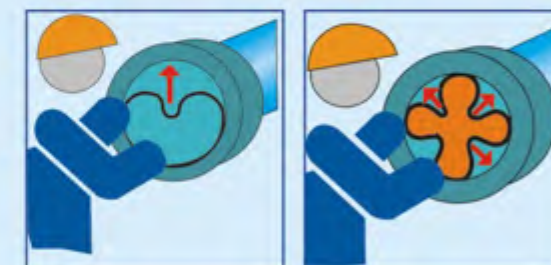


图2-1

图2-2

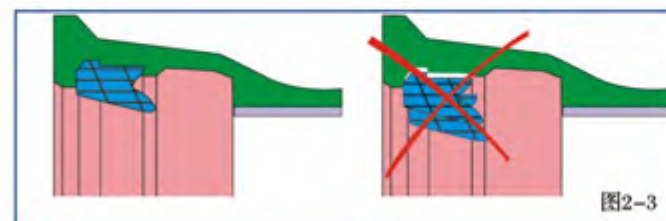


图2-3



5、润滑密封圈内表面和插口处，润滑剂用肥皂水或无毒无味的碱性润滑剂。（见图3）

6、将插口插入承口中直到与密封圈同轴接触，必须正确地校直，使要连接的管子或管件的中轴线相重合。连接管子时，对不同管径的管子应采用不同的工具，小心地将管子连续插入，如发现插入时阻力过大，应立即停止，将管子拔出，检查橡胶密封圈位置和承插口，查明原因并妥善处理，再行插入。要求插入的深度在两条白线中间即可（见图4-1、图4-2、图4-3）

7、将金属直标尺插入承口内和管壁之间的环形空间直至碰到橡胶密封圈，沿管一周测量深度是否均匀。检查相互连接在一起的管子是否同轴心，否则应调整沟底可能出现的凹凸不平。（见图5）

8、当接口安装完毕后，可根据管径调整偏移角，偏移的角度应符合右表要求。（见图6-1、图6-2）

5. Lubricate interface of gasket and spigot end. Lubrication could be soap water or nonpoisonous alkaline lubrication.

6. Insert spigot into socket till touch gasket at the same axle. It must be straightened properly to make the central axle of pipe or fittings coincide. While connecting pipe, different pipe adopts different tools. Insert pipe carefully and continuously, if existing larger resistance force, pipe connection should be stopped immediately then draw out the pipe and check the position of rubber gasket and socket and spigot end. After removing troubles, insert again. The insert depth required should be between two white lines (See fig 4-1, fig 4-2, fig 4-3)

7. Insert straight scale into the circular space between socket and pipe wall till touch the rubber gasket and measure the depth even or not along pipe's cycle. Check the pipes connected with each other whether along the same axle, otherwise the ditch bottom should be adjusted to make irregularity even. (See fig.5)

8. After finish assembling joint, in respect of diameter adjust angular deflection which should satisfy the requirements mentioned in the right list. (See fig6-1, fig6-2)

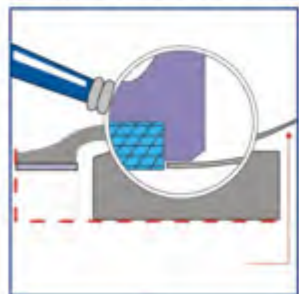


图5



图3

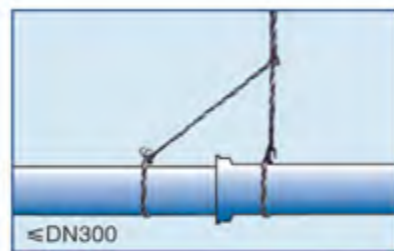


图4-1

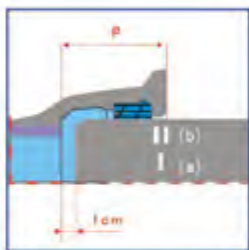


图4-3

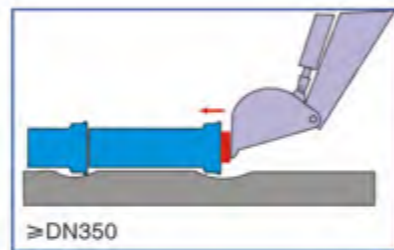


图4-2



图6-1

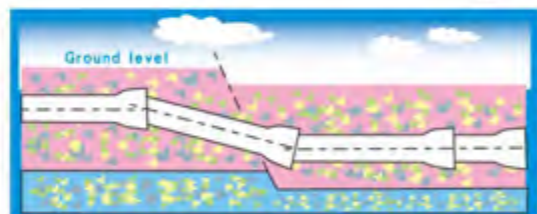


图6-2

DN (mm)	铺设允许偏移角度 Permissible angular deflection while laying
80-150	5° 00'
200-300	4° 00'
350-600	3° 00'
700-800	2° 00'
900-2600	1° 30'

9、回填：一般来说，试压的管线均应在全部回填后再试水压。如遇有特殊要求时，可留出接口部分不回填，而管身中间要充分回填以避免试压过程中管体的移动。对回填用土进行特别选定没有必要，但是直接与管子接触的部分最好选用砂子或者挖方当中的良质土砂用于回填，应当注意使管子的两侧均等地填充土砂，管底也应被土砂充分包围填充。特别需注意的是地下水要尽量排除，以防安装好的管子产生下沉。

### 球墨铸铁管安装时安全注意事项

- 1、进入管沟时必须戴安全帽。
- 2、应仔细检查管沟是否有塌方危险，不安全时绝对不要进入沟内。
- 3、在大口径管上使用矫正千斤顶时，应上下两人撑着进行。
- 4、在进行接口操作时，应当尽可能使用棉手套。
- 5、进入已安装好了接口的管内或为了进行水压试验管内深处时，不可一个人单独进入。特别是埋设后经过一段时间的管子内或者由于事故而中断使用的管线中，往往充满一氧化碳气体，应当充分注意。这种情况下，应携带一氧化碳探测器。



9. Backfill: Generally, pipeline needed testing should be tested water pressure after all backfilled, in particular, the joints could be not backfilled, but the middle part of pipe should be backfilled completely for avoiding pipe movement prior to testing. It is not essential to select earth for backfilling, whereas the part touching with the pipe directly had better select sand or fine earth while excavating. Attention that at the both sides of pipeline should all be filled with sand, same as the pipeline bottom, in particular try to exhaust groundwater and avoid the pipeline subsiding after installation.

### Safety points for attention while assembling pipeline

- ①. It is necessary to wear safety helmet while entering the pipeline ditch.
- ②. It is necessary to inspect the pipeline ditch whether existing dangerous landslide, if exist, absolutely prohibited to enter the ditch.
- ③. While assembling large-diameter pipes with correction jack, the jack must be grasped up and down by two persons.
- ④. While installing joint, cotton padded gloves must be used as far as possible.
- ⑤. It is prohibited to enter the pipe deeply alone after finishing assembling pipeline or for inspecting hydraulic pressure. In particular, if entering the pipeline which have been assembled and buried for a while or broken off for accident, in which would be often filled with CO (carbon monoxide), under this situation, the person should pay full attention and take CO (carbon monoxide) detector.





