



QUALITY  
ASSURED



- HDPE Strengthened Double-wall Corrugation Pipe
- HDPE Spirally Enwound Structure-Wall Pipe
- Reinforced Polypropylene Double Wall Corrugated Pipe



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WUHAN KINGBULL ECONOMIC DEVELOPMENT CO., LTD



## Corporate Introduction

Wuhan Kingbull Economic Development Co. is a high-tech company specialized in R&D and manufacture of pipes, fittings and accessories for plumbing, drainage, gas transportation and heating. Kingbull was established in 1999 and now is leading in domestic piping field.

Kingbull owns 52 national patents and edited 16 piping standards. Kingbull is the vice-president of CPPA (Plastic piping Sub-Committee affiliated with the China Plastic Industry Association). Adhering to the philosophy of "Innovate and Serve" and focusing on three fields: Municipal Facilities, Civil Construction and Natural Resource industries, Kingbull is committed to the research, production and application of environmentally friendly piping systems.

Kingbull products are divided into 6 categories and 19 sub-categories, the main products are: PERT/AL/PERT multilayer pipe, PE/AL/PE multilayer pipe, PEX/AL/PEX multilayer pipe, PE-RT/PEX pipe, Oxygen Barrier PE-RT/PEX pipe, PP-R pipe, PP-R Plastic/Aluminum stable composite pipe, PPR/Steel/PPR multilayer pressure pipe, Polyethylene (PE) pipe system etc. These products are used for hot and cold water distribution inner & outside buildings, NG & LPG transportation, radiator heating, floor and central heating and air-conditioning, HDPE same floor drainage pipe system, HDPE siphonic roof drainage system, PE ground source heat pump system, municipal water supply system, municipal drainage system, gas pipe network system, chemical pipe network system etc.

"Communicate credibility through reputation and quality as well as eliminating customer concerns" is a perfect interpretation of our core values. We take it as our obligation to promote the healthy development & innovation of China's new type of plastic pipe industry. We are sure that we can create a bright future with our customers on the basis of mutual benefits.

## Advanced Technology



Automatic centralized feeding systems  
 Automatic packing  
 High speed and efficient production line

## Reliable Quality



On-site Diameter Test  
 On-site Pressure Test  
 China National Laboratory

## Scientific Management



Adjustable for Humidity&temperature of the Warehouse  
 Quality is Ensured&reliable in Products Transportation&storage  
 ERP System Management

## Certification

Kingbull piping systems have certificates from Australia SAI Global, French BV, Spanish AENOR, Swedish SP, Swiss SGS, ISO 9001, ISO 14001, China National Accreditation Service (CNAS) for Kingbull Lab, and other institutes. Kingbull piping products working life is 50 years and Kingbull provides customers 10 years quality warranty.



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## HDPE Strengthened Double-wall Corrugation Pipe



### Application Advantage

The HDPE strengthened double-wall corrugation pipe was first invented in the 1990s in China, and it has many advantages comparing to other pipes such as

#### ◎High antioutpressure ability

The outlayer has aa hollow annular corrugated, which helps to enhance the ring stiffness of the pipe and increase the load ability of the pipe to soil, comparing to other pipes with same specification and same amount of material. At this point, HDPE strengthened double-wall corrugation pipe is accordingly relatively low, which is another prominent advantage of the pipe.

#### ◎Easy installation

Due to the light wright of the HDPE strengthened double-wall corrugation pipe, the transportation and connection of the pipe is very convenient which makes the construction and maintenance easy. This advantage is more prominent at busy construction time and at hard construction condition

#### ◎Low resistance and high flow volume

HDPE strengthened double-wall corrugation pipe has a higher flow volume than other solid pipes with same material. In other words, smaller diameter HDPE strengthened double-wall corrugation pipe can be used for the same flow volume

#### ◎good low temperature resistance and high impact strength

The brittle temperature of the HDPE strengthened double-wall corrugation pipe is  $-70^{\circ}\text{C}$  . In low temperature condition, usully above  $-30^{\circ}\text{C}$  , it doesn't need to take special precautions and it is very convenient to construct in winnter. Further more, HDPE strengthened double-wall corrugation pipe has high impact strength

#### ◎good chemical stability

As the molecular of HDPE has not polarity, it has good chemical stability.

Except for some oxidants, most chemical reagents cannot do damage to the pipe. Soil, electricity, acid and base will not destroy the pipe

#### ◎Long service life

HDPE strengthened double-wall corrugation pipe can be used for 50 years under the condition of no sunlight and no ultraviolet.

#### ◎Excellent wear-resisting property

According to the experience in Germany, the wearability of HDPE pipe is several times more than steel pipe.

HDPE strengthened double-wall corrugation pipe, as a new type of pipe, has many characteristics such as light weight, antiexternal pressure, hygienic, easy installation, a long service life and so on. It has a low price as well, So it is widely used in drainage system of municipal, rain water , chemical industry area



### Application Field

◎Underground drainage system in municipal area.

◎Irrigation of farm, orchard, and teaplantation.

◎Drain off flood water in hydraulic engineering.

◎ Drainage pipe in chemical industry, pharmaceutical industry and environment protection area.

◎Drainage pipe in the airport, golf course.

◎A protection sleeve for communication and optical cable.

◎ Ventilation system and drainage system in mine and buildings

◎Drainage pipe pre-buried in the railway and freeway.





**HDPE Strengthened Double-wall Corrugation Pipe**

Kingbull HDPE strengthened double-wall corrugation pipe is supposed to do many tests, such as melt flow rate, mixing by twin wheel mixer, vulcanizing press, differential thermal analysis, tensile test, anti-environmental stress cracking tensile test and so on to ensure the physical performance of the pipe

- ◎ Control the process ability of the raw material by testing melt index
- ◎ Control the toughness by testing elongation at break
- ◎ Control the ring stiffness by testing elastic modulus and tensile strength
- ◎ Control weatherability by testing oxidation induction time(OIT)

**The Advantages of Kingbull HDPE Strengthened Double-wall Corrugation Pipe**

**1. It use high class raw material to ensure each property of the pipe**

- ◎ Control the density and melt index to ensure the mechanical property and processability
- ◎ Control the elongation at break to ensure the toughness and increase the ring compliance
- ◎ Control the elastic modulus and tensile strength to ensure the ring stiffness of the pipe
- ◎ Control the OIT to ensure the weatherability



**2. Advanced Horizontal type moulding machine**

- ◎ High production efficiency
- ◎ Equipment runs at a constant speed to ensure a stable size, which is very important for sealing.

**3. Optimize structural design of the product**

- ◎ The design of peaking gives consideration to ring stiffness, ring compliance and peak stability



**Pipe Specification**

Unit:mm

Nominal inner Diameter Dn/ID	Tolerance	outer Diameter	deviation	Min Wall thickness	Min inner Diameter	Min socket depth
225	+4 -5	255	±3	≥1.7	≥258	≥64
300	+5 -6	330	±3	≥2.0	≥342	≥64
400	+8 -8	456	±5	≥2.5	≥461	≥74
500	+9 -10	572	±5	≥3.0	≥577	≥85
600	+10 -12	690	±6	≥3.5	≥696	≥96
800	+11 -15	925	±6	≥4.5	≥931	≥118

Notice: Valid length of pipe is 6 meter with socket

**Ring stiffness**

Unit: KN/m²

Level	SN4	SN8	SN10
Ring stiffness	≥4	≥8	≥10

**Physical property**

Items	Requirements		
Ring stiffness KN/M	SN4	SN8	SN10
	≥4	≥8	≥10
Impact strength (TIR)	≤10%		
Ring compliance	should be smooth, no reverse, bending, no crack		
Oven Test	No delamination, No crack		
Creep rate	≤4		
Joint sealing Test	0.05Mpa pressure for 15 Min, no leakage		

### HDPE Spirally Enwound Structure-wall Pipe

Production line of big diameter HDPE spirally enwound pipe apply state-of-the-art machine in China. The whole procedure under PLC control system, all craft parameters are treated and corrected during the process effectively, ensure the stability of production, factors such as resources、capacity、quality are disposed properly, realize the mission of energy-saving、efficiency、deduction of the intensity of labor while improve work efficiency.

KingbullHDPE Spirally Enwound Structure-wall Pipe apply HDPE as raw material, through extruded as square or rectangle pipe, then forming by enwound machine. Besides normal characteristic of plastic such as good performance on corrosion resistance, insulativity, small fluid resistance, Kingbull HDPE Spirally Enwound Structure-wall Pipe owns excellent strengthen and toughness, good impact strengthen, light weight, uneasy be broken as well. Kingbull HDPE Spirally Enwound Structure-wall Pipe is the ideal replacing products of concrete pipe and cast-iron pipe, as well as one of the main popularized products of Ministry of Construction.

Kingbullmanage production strictly stick to ISO 9001. Kingbull owns the first-rank laboratory of China, as well as whole set of testing machines such as ring stiffness testing machine, automatic control pressure testing machine, impact strengthen testing machine, low temperature and constant temperature box, MFR testing machine、vicat testing machine、electronic tensile tester、pendulum-type impact testing machines and analytical balance、oven、etc.

Meanwhile, the entire process of the raw material purchase, production, on-site examine and service are all in control, all the quality management control work are implemented by well-trained personnel, consequently, ensure the good quality of Kingbull product.

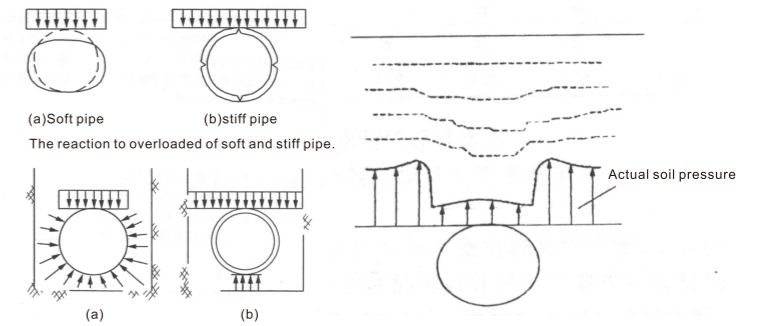
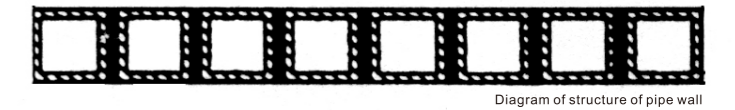
#### Products Features

- 1、Chemical resistance: Free from the corrosion of sewage, waste water and chemicals, as well as free from the corrosion by rotten substance of soil.
  - 2、Impact-proof: The external surface has horizontal "H" structure, perform well under impact and pressure, no broken even the basement subsided and has good restoration after deformation, applicable to any kind of basement well.
  - 3、Aging-resistance: The color of HDPE pipe is black, with longer and better bearing capacity under the expose of sunlight when store on at site of construction.
  - 4、cold-resistant: HDPE pipe can work under -60℃。
  - 5、Light weight: The weight of HDPE pipe is only 1/8 of concrete pipe, easy for construction and transportation.
  - 6、Convenient connection : HDPE installed by thermos-fusion or thermal contraction connection, compare to concrete pipe, with short construction time and lower costs, easier to serve maintenance.
  - 7、Good abrasive resistance: More abrasive compare to concrete and steel pipe, less residue left of sewage and waste water inside the pipe.
  - 8、Low fluid resistance : Inner wall is smooth, low fluid resistance, drainage rate is extraordinary.
  - 9、Economical: Be available to construct without digging jobs, cost of construction, management and maintenance is lower.
- Environmental-friendly: HDPE pipe is the most suitable material to environmental-friendly because it is sanitary and non-toxic, can be recycled.



#### Application Advantage

◎ Good impact strengthen:



◎ **Good hermeticity:** apply socket rubber connection or eletro-thermal fusion connection and thermal contraction connection, good hermeticity and no leakage.

◎ **Good chemicals:** Uneasy to breed bacterium、fouling ; uneasy to be corrosive; uneasy to accumulate acid subsistence and acid air;

◎ **Good abrasive resistance:** More abrasive compare to concrete pipe, less residue left of sewage and waste water inside the pipe.

◎ **Light weight:** The weight of HDPE pipe is only 1/8 of concrete pipe, only excavator needs, heavy machine is not necessary.

#### Application Fields

- ◎ **Construction:** Drainage of construction、 underground drainage、 pollution discharge、 Building ventilation
- ◎ **Industrial:** Sewage drainage of chemical、 medical、 environmental-friendly industry.
- ◎ **Municipal:** Drainage of municipal sewage;
- ◎ **Agriculture:** Irrigation of farmland, orchard, garden and forest belt.
- ◎ **Traffic:** drainage and seepage of water of railway、 railway、 highway
- ◎ **Water conservancy:** sinking work
- ◎ **Other area:** Drainage and seepage of water of other industry such as golf course and football field.



*Pipe Specifications*

规格(mm)	管系列	规格(mm)	管系列
300	SN4	800	SN4
	SN6.3		SN6.3
	SN8		SN8
	SN10		SN10
	SN12.5		SN12.5
	SN12.5		SN12.5
400	SN4	1000	SN12.5
	SN6.3		SN4
	SN8		SN6.3
	SN10		SN8
	SN12.5		SN8
	SN12.5		SN10
500	SN4	1200	SN4
	SN6.3		SN6.3
	SN8		SN8
	SN10		SN10
	SN12.5		SN12.5
	SN12.5		SN12.5
600	SN4	1200	SN6.3
	SN6.3		SN8
	SN8		SN10
	SN10		SN12.5
	SN12.5		SN12.5
	SN12.5		SN12.5

Production stick to GB/T 19472.2-2004

Non-digging buried HDPE spirally enwound pipe are divided as engineer traction force into two level-13 ton and 20 ton, please purchaser be clear about the application level.

Products are generally black, other colors are available upon request

The length of pipes are generally 6 m, other length is available upon request.

*Mechanical Property*

Item	Requirement	
Ring stiffness/(kN/m <sup>2</sup> )	SN4	≥ 4
	SN6.3	≥ 6.3
	SN8	≥ 8
	SN10	≥ 10
	SN12.5	≥ 12.5
Impact strengthen	TIR ≤ 10%	
Ring compliance	No delamination, no broekn	
Longitudinal reversion	≤3%, pipe should be no delamination and broken	
Creep rate	≤4	
Expand tensile/N DN/ID ≤ 300 400 ≤ DN/ID ≤ 500 600 ≤ DN/ID ≤ 700 DN/ID ≥ 800	The minimum tensile strengthen 380 510 760 1020	

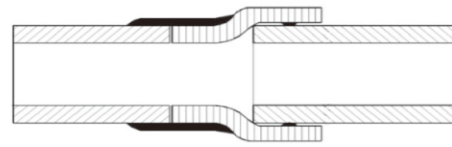
*Properties Of Solids*

Item	Requirement	Testing Method
Inner pressure test <sup>a</sup> ( 80°C、3.9MPa、165h )	No broken and leakage	GB/T 6111–2003 Using Style a sealing joint
Inner pressure test <sup>a</sup> ( 80°C、2.8MPa、1000h )	No broken and leakage	
MFR ( 190°C、5kg )	MFR ≤ 1.6g/10min	GB/T 3682–2000
Thermal stability (200°C)	OIT ≥ 20min	GB/T 17391–1998
Density	≥ 930kg/m <sup>3</sup>	GB/T 1033–1986
Testing with pipe of which wall is hollow that extruded by the testing raw material		

*Design & Installation*

Construction should be subject to CECS164:2004

**Socket connection:**



Diagram



F style elastic rubber



**Electro-thermal fusion installation:**



1. Pipe centering

2. wipe the adhesive substance on the surface of pipe

3. wind the electro-thermal belt



4. use clamp and buckle fix the welding piece

5. electro-thermal fusion

6. after cooling down completely, loosen the buckle.



**Reinforced polypropylene**

Reinforced polypropylene Double Wall corrugated Pipe, use polypropylene as the main polymer materials adding suitable amount of reinforced material, modified additives and excipients, with unique molding process device extrudes continuously, of which the inner wall is smooth, high intensity, the outer wall does not have the combination of longitudinal reinforcement and transverse reinforcement is a new type of buried drainage pipe.

**Characteristic of Connection and performance**

Reinforced polypropylene Double Wall corrugated Pipe usually apply the socket connection and sealed with rubber, has some characteristic below:

- ◎Extended the length of socket, usually is 200-300mm, seldom drop during construction, ensured the quality of project.
- ◎Sealing with rubber lower the leakage to the minimum
- ◎Anti-leakage, good corrosion resistance, aging resistance, cracking resistance, long service life, usually more than 50 years.
- ◎Light weight, no needs for heavy lifting facilities, very easy to transfer and install.
- ◎Good strengthen and stiffness, categorized as flexible plastic pipe, under conditions of correct design and construction, completely meet the requirement of bearing negative pressure of buried pipe.

**Application:**

- ◎Municipal, construction and building drainage system
- ◎Sewage treatment plant drainage system
- ◎Airport, port, highway drainage system
- ◎Agricultural irrigation, water supply, drainage system
- ◎Chemical, mine industry special fluid supply and drainage system
- ◎Conduit for Buried cable and postal telecommunications cable





### Pipe Specification

DN/ID	$d_{im, min}$	$e_{min}$	$e_{1, min}$	$A_{min}$
225	215	0.8	0.7	115.0
300	290	1.6	0.8	145.0
400	388	2.0	1.0	175.0
500	486	2.5	1.5	185.0
600	584	3.0	2.5	220.0
800	780	4.5	3.0	250.0

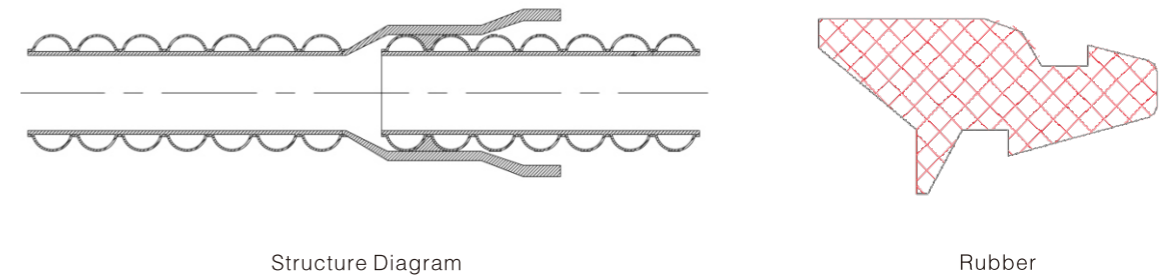
### Ring Stiffness

Rank	SN4	(SN6.3)	SN8	SN10	(SN12.5)
Ring Stiffness (kN/m <sup>2</sup> )	4	(6.3)	8	10	(12.5)

### Pipe Physical Performance

Item		Requirement
Ring Stiffness (KN/m <sup>2</sup> )	SN4	≥4
	(SN6.3)	≥6.3
	SN8	≥8
	SN10	≥10
	(SN12.5)	≥12.5
Impact strenthen ( TIR ) %		≤10
Ring compliance		Smooth, No delamination, No broken
Oven test		No bubble, No delamination, No cracking
Creep rate		≤4

### Construction Style



### Installation Attention

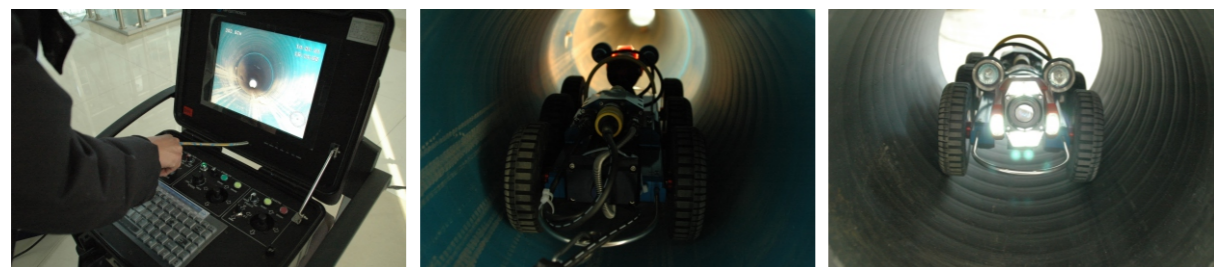
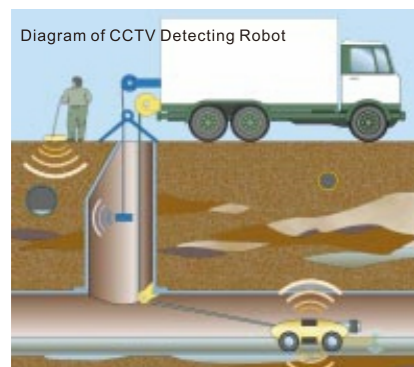
Pipeline should be constructed on the undisturbed soil foundation or backfilled ground with dense soil after notching, thickness from the top of pipe to the ground of traffic line should not less than 0.7m. Pipeline should be laid linearly, if needs curve laying with soft connection, each socket end. Should have no more than 2° compare to the corner. Drainage pipeline project can be constructed in the same groove, however, it must be subjected to relative regularity of effecting standard of construction in the same groove of drainage piping system. Pipeline across the railway or high-rank. Way- construction with barrier should set up concrete, steel, cast-iron protection pipe, the inner diameter should be 0.2m thicker than the reinforced outer diameter. When the site of project has higher underground water level than the dug groove, an action of decreasing the underground water lever should be applied that keeping making the level 0.3-0.5m lower than the lowest place of dug groove until the backfilled project has finished.



### CCTV Detecting Robot

CCTV Detecting Robot equipped the state-of-the-art camera, crawling machine and lighting system, monitor that completely controlled by remote control lever, easy operation and moving.

CCTV Detecting Robot can process image, record the spin and location of camera. CCTV Detecting Robot recording with high quality image and process verbal edit automatically. The main structure of this robot consist of four-wheel drive camera and a tiny computer. According with different diameter of pipe, pick different CCTV Detecting Robot. By CCTV Detecting Robot, we can observe the entire situation inside the pipe. CCTV Detecting Robot applies on project that unable to access the real situation of the inside of pipe. Before examine, high-pressure washing vehicle is needed to wash the part which needs detection in order to make sure that the robot can get through in the pipeline, then use a special packer to block the upper drainage pipe( introduced the packer made in Germany, this kind of packer is made of rubber, with filling air into the rubber to make it expanded so that it can block the pipe), next, use water pumper pump the sewage of well to other sewage well nearby, wait until the water level of pipe to be observed is less higher than the top of robot, it is time for robot to work. When finished pumping the sewage of well, the observation of fluid can be detected as well , because the part of pipe that under the water has come out of the water.



Perfect service system to maximize customer needs.

