

賢興建材(集團)有限公司
Yin Hing Construction Materials (Group) Ltd



HOLLY Light Gauge Stainless Steel Pipe and Fittings



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簡介

INTRODUCTION

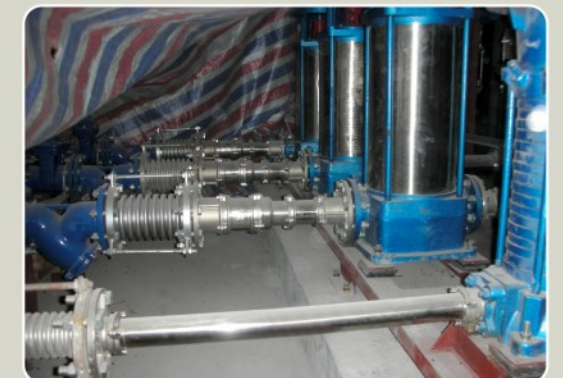
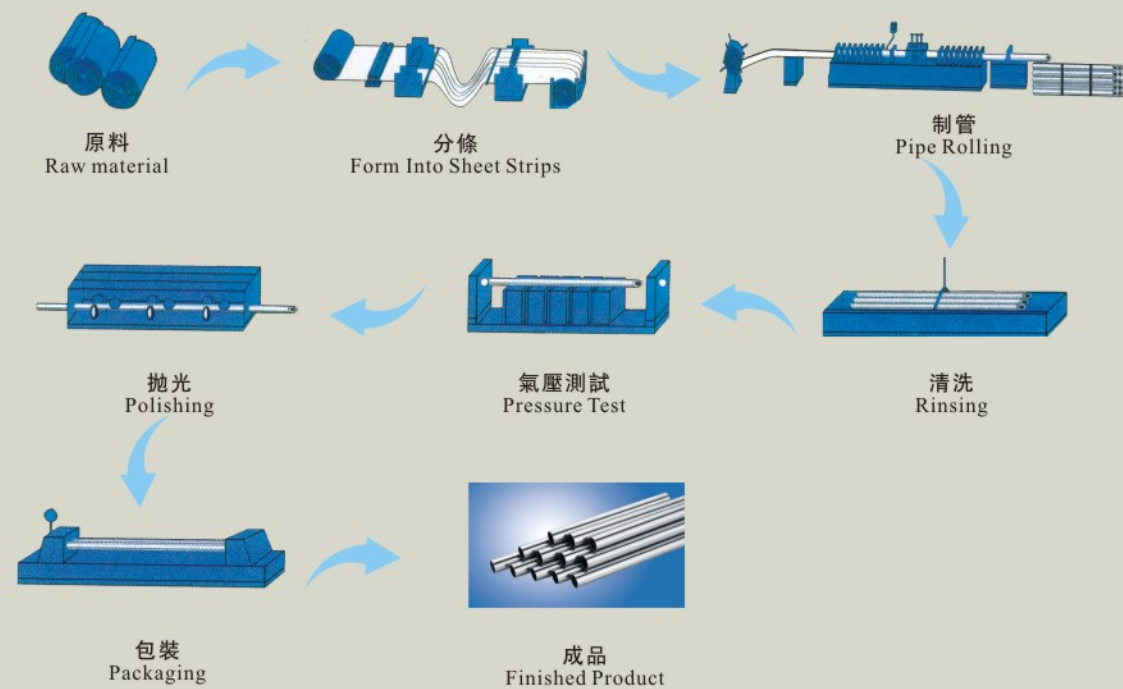
HOLLY不銹鋼薄壁管及配件符合歐盟標準BS EN 10312、BS EN 10088及BS6920，接駁方式分為壓坑及凸點兩種，生產過程嚴格執行ISO14000標準。產品具有耐高溫（低溫）、耐壓、耐腐蝕、衛生性能優越等特點。施工簡便、快捷，安裝工具使用簡單易學，可廣泛應用於冷熱水管、消防管、中央空調管和各類氣管。

Holly stainless steel pipes and fittings meet the European standards BS EN 10312, BSEN 10088, and BS 6920. The two types of joining methods are grooved and bump point connections. The manufacturing process strictly enforced the ISO14000 standards. All the products have a high tolerance for high heat, low temperature, high pressure, corrosion, great hygienic properties and more. Convenient, quick and simple to use. Specialized tools make it easy for assembly. Holly stainless steel pipes can be widely used for cold and hot water, fire services, central air conditioning and other gas piping.



管材生產車間
Tube Manufacturing

生產工藝流程 PRODUCTION PROCESS FLOW



不銹鋼管及配件組裝示範
Assembly of stainless steel pipe and fittings



常用喉管性能介紹

COMMONLY USED PIPE MATERIAL CHARACTERISTICS

眾所周知，自來水出廠時的水質是符合政府標準的。但乾淨水在管道經遠距離輸送過程中，容易受到各種不同管道材質的污染，俗稱二次污染。那麼管道材質如何造成水質二次污染呢？分述如下：

It is widely known that potable water meets all the government standards when it leaves the water treatment facilities but clean fresh water can easily be contaminated by different piping materials during the long distance of conveyance to the consumers. This is called post-contamination. The analysis belows shows how different piping materials can cause post-contamination:

鍍鋅管

當你發現洗手盤，馬桶有紅黑水垢時即表示水質受到鍍鋅管銹蝕、重金屬等二次污染，長期飲用會造成膽、腎、膀胱、尿道等人體各種結石主要源頭。

Galvanized Iron (G.I.) Pipes

When a reddish, black water stain is found in the washing basin and toilet, this indicates that the water has been post-contaminated by rust (iron oxide) within the galvanized iron pipe. Long term consumption of the water can cause stone formation in the gall bladder, kidney, urine bladder, and urinal track.

塑料管

塑料材料是一種高分子化合物，如：PPR是聚丙烯分子構成的，而聚丙烯分子是由幾十萬個碳原子和氫原子構造而成的材料，其重量和密度與水較接近，其分子結構中的添加劑如：增塑劑，碳酸鈣添加劑等極容易遊離到水中。造成管道中乾淨水受到化學異物等二次污染，其中大部分塑料製品都離不開增塑劑，而增塑劑含聯苯酚A。據美國、英國、日本等專家長期研究，男性精子在50年中減少一半，以及婦科疾病和聯苯酚A有關，被國外專家定義為環境荷爾蒙。

塑料管具有透光和透氣性，當管內水質受到光照射時，形成光合作用，管內壁自然會滋生微生物俗稱綠苔，令水質長期受到污染。

Plastic Pipes

Plastic is a high molecular mass, synthetic material. One example is PPR, it is formed by chains of polypropylene; polypropylene molecules are formed from tens of thousands of carbon and hydrogen molecules. The density and mass of PPR is close to that of water. Chemicals such as plasticizer, and calcium carbonate additives used in the manufacturing of plastics are highly soluble and can cause chemical post-contamination to fresh water inside plastic pipes. Most plastic products use plasticizer in its manufacturing and plasticizers contain phthalates. According to extensive studies by researchers from the United State, England and Japan, it was found that phthalates are related to the reduced sperm count in men in the past 50 years and many female deceases. Many specialists had named plasticizers as an environmental hormone for this reason.

Plastic has the ability to allow light and oxygen to permeate. When light comes into contact with a plastic pipe, photosynthesis occurs resulting in growth of microorganisms and algae inside the pipe. This causes long term contamination to the water source.



常用喉管性能介紹

COMMONLY USED PIPE MATERIAL CHARACTERISTICS

銅管

銅在自然環境和水環境中容易產生銅綠（主要成份為硫酸銅和碳酸銅），硫酸銅有毒，易溶於水，對人體內黏膜有刺激和腐蝕作用，對腸道有輕微刺激作用，對人們肝臟傷害更大，由於肝臟是不能降解和化解硫酸銅的，經美國科學研究發現：肝硬化，肝癌發病高居不下，與銅管中產生硫酸銅造成二次污染有關，以香港為例，上世紀70-80年代，香港主要採用鍍鋅管作為給水管，膽、腎、肝結石等排行各種疾病第二位，80-90年代銅管替代鍍鋅管後，現時香港肝癌病例從原來的第12位上升到第2位，結石降至第10位。

Copper Pipes

Copper under the natural environment can easily form green copper oxide (major components are copper sulfate and copper carbonate). Copper sulfate is toxic and is soluble in water. It can cause irritation and corrosion to mucus membranes in our bodies and cause minor irritation to the intestinal tracks. Since our livers are not able to break down and pass through copper sulfate, the damage can be extensive. Scientific research from the United States revealed that cirrhosis and liver cancer are related to post-contamination to the water supply by copper sulfate in copper pipe. In Hong Kong for example, galvanized iron pipes are the most common piping material for fresh water supply in the 1970's to 1980's; gall bladder, kidney and liver stones diseases are rated the second most common diseases at that time. In the 1980's and 1990's, copper pipes had replaced galvanized iron pipes, now liver cancer cases had risen from the original 12th place to second place and organ stone related cases had dropped to the 10th place.

不銹鋼水管

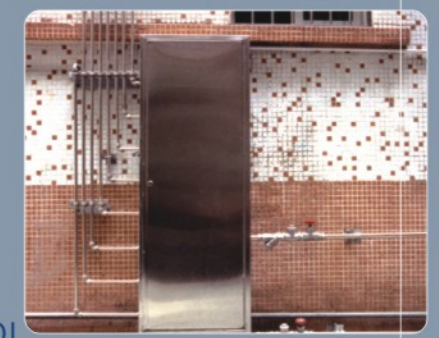
不銹鋼材質不僅應用於醫療、食品、飲料、石油化工和我們家中的餐具、茶壺。經過幾十年應用證明不銹鋼材料具有優良耐腐蝕性、衛生性、不生銹、不釋放異物，而且自潔性好、使用壽命長、環保，可百分之百回收再用，對水質不會造成二次污染，是人類現實最優秀管道輸送材料之一。歐洲及日本自上世紀70年代開始使用不銹鋼作為水管，給水系統至今還應用良好，還未發現對人體有不良影響的案例。因此不銹鋼水管普及率高，德國達70%，日本達90%。在我國的北京、上海、天津、廣州、深圳等大型政府建設項目，四星以上酒店、醫院、學校都逐漸使用不銹鋼水管。

可以預言不銹鋼水管必將成為城市管網，供水和建築用管主力軍，必然取代塑料管、鍍鋅管及銅管。

Stainless Steel Pipes

Stainless steel are used in a wide variety of industries such as in medical equipment, food and drink industry, oil fields, and our household supplies such as cutleries and tea pots. After several decades of use, stainless steel had proven that it has excellent properties such as corrosion resistant, rust resistant, hygienic, chemical leaching resistant, self-cleaning, long lasting, environmental friendly, and can be 100% recycled. Since stainless steel pipes do not cause post-contamination, it is one of the most ideal pipework material for civilization. Since the 1970's, Europe and Japan had already began using stainless steel pipes in their water supply system. These stainless steel water systems are still in excellent conditions and no related negative health cases had been reported. For this reason, stainless steel pipework occupies a large share of the market, for example, Germany is 70%, and Japan is over 90%. In mainland China, government building projects in Beijing, Shanghai, Tianjin, Guangzhou and Shenzhen, four star and above hotels, hospitals and schools had all began to use stainless steel pipework.

It is predicted that stainless steel will replace plastic, galvanized iron, and copper to become the major material for water conveyance throughout cities.



品質 傳遞健康 QUALITY CONTROL

各類管材主要物理性能比較表 Pipe Properties Comparison Chart

管材 Pipe Material	密度 Densrty (kg/m ³)	平均熱膨脹系數 Linear Expansion Coefficient (10-6/°C)	導熱係數 Coefficient Of Thermal Conductivity (W/m°C)	比熱熔 Specific Heat Capacity (j/kg/°C)	電阻率 Resistivity (kmm ² /m)	楊氏模量 Young's Modulus (kN/mm ²)	磁性 Magnetism	
HOLLY不銹鋼管 Stainless Steel Pipe	7930	16	15	500	0.72	200	無	
銅管 Copper Pipe	8900	17.6	340	340	0.02	110	無	
碳鋼管 Carbon Steel Pipe	7850	11.6	60	60	0.14	210	有	
鋁塑複合管 Aluminum Plastic Tube	926	25	0.15	1050				
塑料管 Plastic	UPVC	1350	70		C.10-16	/	無	
	PE,PEX,PB	950	140	0.05				1470
	PP-R	900	110					



HOLLY 不銹鋼管優點

Holly Stainless Steel Product Advantages



優秀 健康 衛生

HOLLY水管及配件是採用優質 (SUS304,304L,316,316L) 材料製成，確保水質衛生不受第二次污染，不生銹、不結垢、不滲出有害物質。配件所使用之密封圈符合BS6920標準，並取得英國WRAS飲用水證書 (編號：1403511)。

High Quality Healthy Hygienic

Holly stainless steel pipework is manufactured from quality SS304, 304L, 316 and 316L ensuring the water quality does not get contaminated by post-contamination, rusting, and chemical leaching. Seal ring of the fittings fulfills the requirements of BS6920. It acquires British WRAS certificate on drinking water (approval number: 1403511)

耐腐蝕 使用壽命長

不銹鋼為什麼耐腐蝕不生銹？是不銹鋼表面有一層含有18%以上富鉻氧化層，該膜阻止金屬繼續氧化，形成致密保護膜，即使遭到機械損壞，也能迅速再生形成保護膜，因此HOLLY水管的使用壽命幾乎與建築物的壽命一致。

Corrosion Resistant and Long Lasting

Why is stainless steel corrosion and rust resistant? The surface of stainless steel has a film of chromium oxide protective barrier that prevents further oxidization to the metal. Even if the film is mechanically damaged, the protective film can regenerate on its own, therefore, the life span of Holly stainless steel pipes are as long as the building itself.

節能環保

HOLLY水管的強度高於鍍鋅管，但同管徑的管材只有其重量的五分之一，因此生產和應用過程節省大量金屬材料和生產能源。不銹鋼耐腐蝕不生銹，自潔性能好，不會污染水質，不會造成水源頭損失浪費，管材表面美觀光潔，不污染周邊環境，在工程應用中能夠100%回收再生，是目前最環保的管道材料。

Energy Efficient Environmental Friendly

The tensile strength of Holly stainless steel pipes is stronger than galvanized iron pipes but for the same pipe diameter, the weight of the stainless steel pipe is only one fifth of galvanized iron pipe, therefore, significant amount of materials and energy were saved during the manufacturing process. Since stainless steel is corrosion and rust resistant, has self-cleaning abilities, and will not affect the water quality, there would be no wasting of water at the water source. The clean and shiny appearance of the pipework will not affect the image of the environment, it can also be 100% recycled to be manufactured back into new products. Based on the above it is by far the most environmental friendly piping material in the industry.

安全 穩固性好

HOLLY水管採用凸點不損傷管端銜接技術，水管破壞性水壓測試超10MPa，抗水錘沖擊振動時不反鬆。管內壁光滑、阻力小、耐熱性能高，不受陽光照影響，在自然狀態下使用超過100年。

Safe Highly Reliable

Holly stainless steel pipes use a bump point joining method that does not damage the pipe ends. With this joining technique the pipe bursting pressure exceeds 10MPa; the connection method also does not come loose due to vibration from water hammer. Stainless steel pipes have low friction interior, high heat tolerance, and resistance to the sunlight's ultra violet rays, under normal circumstances it can be used for over 100 years.

施工快捷方便

使用專用工具在管端口壓起凸點後，在管端口戴上密封圈後插進管接頭內，擰緊頂帽即可承受20公斤水壓。每個接頭安裝速度比焊接管道快10倍，比鉸螺牙快5倍。在進行水壓試驗時發現有滴漏擰緊頂帽即可，無須切管即可維修安裝，質量有保證。

Efficient and Convenient Joining Methods

After using a special tool to create bump points near the pipe ends, the silicone seal ring is slipped on to the end. The pipe is then pushed into the fitting, tighten the screw nut and the connection can immediately withstand 2MPa of water pressure. The time to connect each joint is 10 times faster than soldering and 5 times faster than threading a pipe then installing a fitting. If leaks were to be observed during a water test, the only thing required to stop the leak is to tighten the screw nut, no cutting is required and the quality of the joint is assured.

管道維修更改方便

HOLLY水管與管件連接屬於活接式連接，即管材每一段都是活接，安裝和拆卸時只需一個活動扳手即可，可反複安裝和拆卸不損傷管材和管件，因此真正實現安全、快捷、簡易安裝的目的。

Easy Maintenance and Alteration

Holly stainless steel pipe and fittings uses a reusable connection, therefore, to install or un-install a joint, it can be completed with a crescent wrench for repeated times without damaging the pipe or the fitting. This truly demonstrates the goal for a safe, quick and easy installation.



材料性能介紹

MATERIAL INTRODUCTION

密封圈性能和壽命

HOLLY管的O型密封圈是採用有機硅膠，其最高工作溫度為100°C。從耐高溫之壽命推算依據T.W.Dakin的反應速度論，用Arrhenius的反應速度公式為基礎作加速老化試驗方法，具有高度的權威性，也被廣泛使用！

$2.303 \log K = -E/RT + C$ (K:反應速度參數; E:活化能; R:介質參數; T:絕對溫度)

根據上式，橡膠老化反應可按以下圖表推算出來：

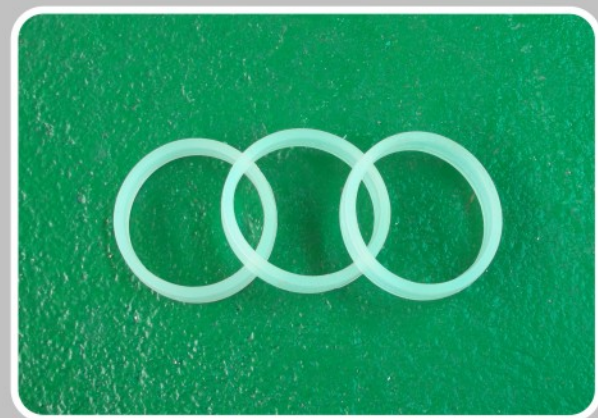
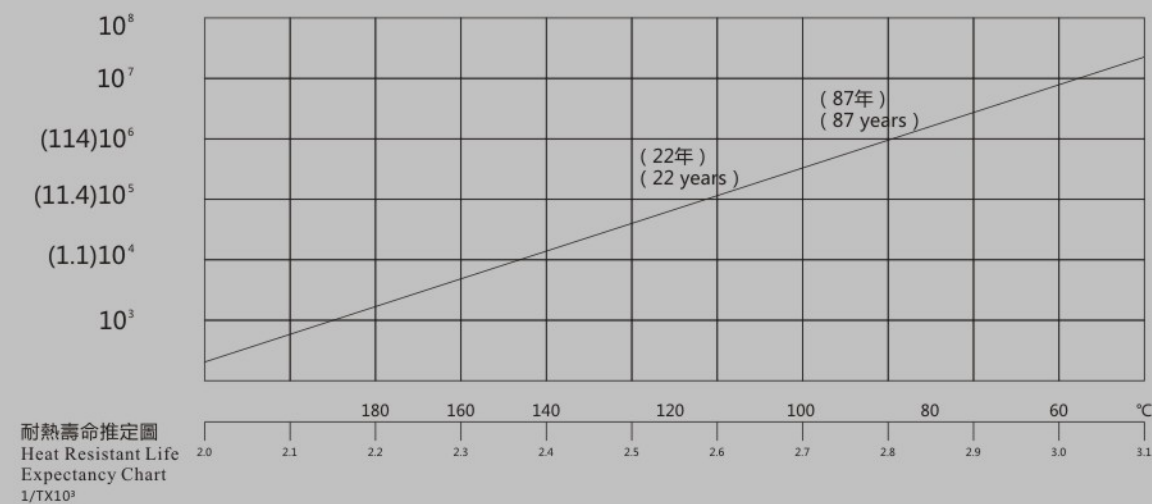
Silicone Seal Ring Properties and Working Life

The O-shape seal ring for Holly stainless steel pipes and fittings uses an organic silicone rubber. Its highest operating temperature is 100°C. The seal ring's life expectancy due to thermal effects is predicted based on T.W. Dakin's rate of reaction theory combining with Arrhenius rate of reaction formula. This method is highly authoritative and widely used.

(K= rate constant; E=activation energy; R=gas constant; T=absolute temperature)

Based on the above equation, the rubber's degrading rate can be predicted using the below chart.

時間 (Hour)



管材規格

PIPE LIST



不銹鋼水管
Stainless Steel Pipes

管材規格與尺寸 PIPE SPECIFICATION AND SIZES

不銹鋼水管規格 Specification Of Stainless Steel Pipe				
通稱DN Nominal Size	管外徑Φ Outside Diameter	壁厚mm Thickness	英寸 Inch	工作壓力 Working Pressure
15	15	0.60	1/2"	2.0Mpa -40°C ~ 120°C
20	22	0.60	3/4"	
25	28	0.80	1"	
32	35	0.80	1-1/4"	
40	42	1.00	1-1/2"	
50	54	1.00	2"	
65	66.7	1.20	2-1/2"	1.6Mpa -40°C ~ 120°C
80	76.1	1.50	3"	
100	108	1.50	4"	
150	159	2.00	6"	
200	219	2.50	8"	1.0Mpa -40°C ~ 120°C
250	273	2.50	10"	
300	323	3.00	12"	

FITTINGS LIST



不銹鋼螺帽配件 Stainless Steel Screw Nut Type Fittings

名稱 Name	尺寸 Size
外牙咀 Female Coupling 	S15*1/2M"
	S15*3/4M"
	S22*1/2M"
	S22*3/4M"
	S22*1M"
	S28*1/2M"
	S28*3/4M"
	S28*1M"
	S35*1 1/4M"
	S42*1 1/2M"
	S54*2M"

名稱 Name	尺寸 Size
內牙咀 Female Coupling 	S15*1/2F"
	S15*3/4F"
	S22*1/2F"
	S22*3/4F"
	S22*1F"
	S28*1/2F"
	S28*3/4F"
	S28*1F"
	S35*1 1/4F"
	S42*1 1/2F"
	S54*2F"

名稱 Name	尺寸 Size
90° 曲 90° Elbow 	L15*15
	L22*22
	L28*28
	L35*35
	L42*42
	L54*54

名稱 Name	尺寸 Size
45° 曲 45° Elbow 	L15*15
	L22*22
	L28*28
	L35*35
	L42*42
	L54*54


名稱 Name	尺寸 Size
梳杰 Coupling 	S15*15
	S22*22
	S28*28
	S35*35
	S42*42
S54*54	

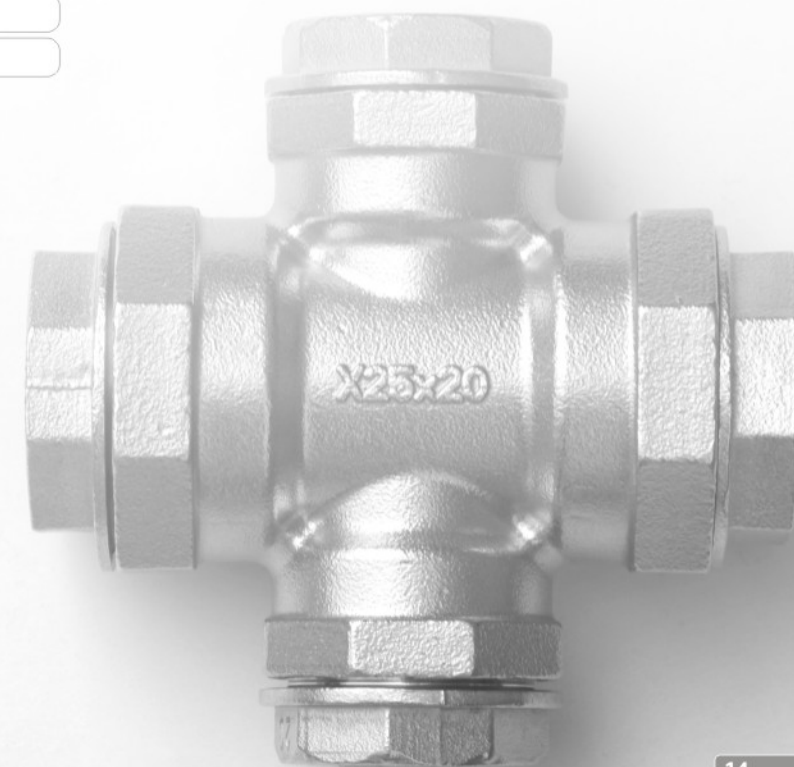
名稱 Name	尺寸 Size
外牙曲 Male Elbow 	L15*1/2M"
	L20*3/4M"
	L25*1M"

名稱 Name	尺寸 Size
龍頭座 Female Wallplate Tee 	DL15*1/2F"
	DL22*1/2F"

名稱 Name	尺寸 Size
十字叉 Cross Tee 	X15*22*22*15
	X15*28*28*15
	X22*28*28*22
	X22*35*35*22
	X28*35*35*28
	X28*42*42*28
	X28*54*54*28
	X35*42*42*35
	X35*54*54*35
	X42*54*54*42

名稱 Name	尺寸 Size
90° 大小曲 90° Reducing Elbow 	L22*15
	L28*15
	L35*15
	L28*22
	L35*22
	L35*28
	L42*28
	L54*28
	L42*35
	L54*35

名稱 Name	尺寸 Size
刁士 Reducer 	S22*15
	S28*15
	S35*15
	S28*22
	S35*22
	S35*28
	S42*28
	S54*28
	S42*35
	S54*35



FITTINGS LIST



不銹鋼螺帽配件 Stainless Steel Screw Nut Type Fittings

名稱 Name	尺寸 Size
大肚叉 Reducing Tee 	T15*22*15
	T15*28*15
	T22*28*22

名稱 Name	尺寸 Size
三叉 Tee 	T15*15*15
	T22*22*22
	T28*28*28
	T35*35*35
	T42*42*42
	T54*54*54

名稱 Name	尺寸 Size
中牙叉 Female Tee 	T15*1/2F*15
	T22*1/2F*22
	T22*3/4F*22
	T28*1/2F*28
	T28*3/4F*28
	T28*1F*28
	T35*1 1/4F*35
	T42*1 1/2F*42
	T54*2F*54


名稱 Name	尺寸 Size
朱咀叉 Reducing Tee 	T22*15*15
	T28*15*15
	T28*22*22

名稱 Name	尺寸 Size
內牙曲 Female Elbow 	L15*1/2F"
	L15*3/4F"
	L15*1F"
	L22*1/2F"
	L22*3/4F"
	L22*1F"
	L28*1/2F"
	L28*3/4F"
	L28*1F"
	L35*1 1/4F"
	L42*1 1/2F"
	L54*2F"

名稱 Name	尺寸 Size
大小叉 Reducing Tee 	T22*15*22
	T28*15*28
	T35*15*35
	T28*22*28
	T35*22*35
	T35*28*35
	T42*28*42
	T54*28*54
	T42*35*42
	T54*35*54
	T54*42*54

名稱 Name	尺寸 Size
馬肚曲 Crossover 	15*1/2
	22*3/4
	28*1


不銹鋼法蘭活接配件 Stainless Steel Flanged Type Fittings

名稱 Name	尺寸 Size
90° 曲 90° Elbow 	L66.7*66.7
	L76.1*76.1
	L102*102
	L159*159
	L219*219
	L273*273
	L323*323

名稱 Name	尺寸 Size
外牙咀 Male Coupling 	S66.7*21/2M"
	S76.1*3M"
	S102*4M"

名稱 Name	尺寸 Size
45° 曲 45° Elbow 	L66.7*66.7
	L76.1*76.1
	L102*102
	L159*159
	L219*219
	L273*273
	L323*323


名稱 Name	尺寸 Size
梳杰 Coupling 	S66.7*66.7
	S76.1*76.1
	S102*102
	S159*159
	S219*219
	S273*273
S323*323	


名稱 Name	尺寸 Size
佛蘭 Flange 	F42*1 1/2"
	F54*2"
	F66.7*2 1/2"
	F76.1*3"
	F102*4"
	F159*6"
	F219*8"
	F273*10"
	F323*12"

名稱 Name	尺寸 Size
刁士 Reducer 	S66.7*54
	S66.7*42
	S66.7*35
	S66.7*28
	S66.7*76.1
	S66.7*108
	S76.1*108
	S76.1*159
	S102*159
	S102*219
	S159*219
	S159*273
	S159*323


FITTINGS LIST

名稱 Name	尺寸 Size
 <p>三通 Tee</p>	T66.7*66.7*66.7
	T76.1*76.1*76.1
	T102*102*102
	T159*159*159
	T219*219*219
	T273*273*273
T323*323*323	

名稱 Name	尺寸 Size
 <p>盲餅 Blank Flange</p>	DN42
	DN54
	DN66.7
	DN76.1
	DN102
	DN159
	DN219
	DN273
	DN323

名稱 Name	尺寸 Size
 <p>大小叉 Reducing Tee</p>	T76.1*66.7*76.1
	T102*66.7*102
	T159*66.7*159
	T102*76.1*102
	T159*76.1*159
	T159*102*159
	T219*102*219
	T219*159*219
	T273*159*273
	T323*159*323
	T273*219*273
	T323*219*323

管道安裝工具及配件 Installation Tools and fittings

名稱 Name	尺寸 Size
 <p>鉗壓凸點工具 Bump Point Plier</p>	DN15-28
	DN35-54

名稱 Name	尺寸 Size
 <p>專用扳手 Wrench</p>	R54-42
	S54-42
	R35-28
	S35-28
	R22-15
	S22-15

名稱 Name	尺寸 Size
 <p>鉗壓凸點工具 Bump Point Press</p>	DN66.1-DN102
	DN159
	DN219-DN323

名稱 Name	尺寸 Size
 <p>塞 Plug</p>	DN15
	DN22
	DN28
	DN35
	DN42
	DN54

INSTALLATION

本產品可按照工程需要，用壓坑或凸點兩種方法接駁：

According to the needs of different projects, our pipe and fittings can be connected by two methods - Groove Installation or Bump Point Installation

壓坑接駁

1. 用手動或電動切割器切斷管材後，去除管口內外毛刺並整圓。(圖①)
2. 確保壓坑機中央軸輪的口徑配合管材的尺寸。將頂帽(或法蘭蓋)套進管材後，將管端套在中央軸輪外轉動頂部的壓開把手直至管材被中央軸輪及滾軸緊逼著。(圖②)
3. 一面轉動壓坑把手。一面轉動頂部的壓開把手以緊逼著管材，直至管端開始形成一道凸槽。重複步驟直至凸槽成形。(圖③)
4. 將密封圈套進管材凸槽的後面，確保密封圈不要包裹著凸槽。(圖④)
5. 把管材和密封圈一起插進管內，逐漸擰緊螺帽，最後用扳手將頂帽收緊(或把法蘭蓋螺絲孔對準管件的螺絲孔後，將螺栓逐個擰進管件上，再用六角匙對角線逐個擰緊)。(圖⑤)

口徑 (mm) Diameter	凸點數量 number of bump points
15 - 22	2點以上 - 2 or above
28 - 35	3點以上 - 3 or above
42 - 54	4點以上 - 4 or above

Groove Installation Method

1. Cut the pipe to a suitable length using a hand-cutter or a cutting machine. Remove any burrs and ensure the pipe edge is still circular. (photo 1)
2. Ensure the centre rolling pin is for the correct pipe size. Slip screw nut (or flange for flange style) onto the pipe. Slip the pipe end onto the centre rolling pin. Turn the top handle to lower the rolling pin until the pipe is firmly held by the rolling pin and the rollers. (photo 2)
3. Begin turning the handle and lower rolling pin as the groove begins to form on the pipe end. Repeat step 3 until a desired groove size is observed. (photo 3)
4. Slip the seal ring onto the pipe end. Ensure not to cover the groove with the seal ring. (photo 4)
5. Push pipe with the seal ring into the fitting. For the screw nut style fittings, tighten screw nut onto the fitting and complete final tightening with a crescent wrench. (For flange style, line up the flange and the fitting's screw holes, insert screws into holes and tighten screws with an Allen key. Tighten screws in a crisscross fashion). (photo 5)



凸點接駁

1. 用手動或電動切割器切斷管材後，去除管口內外毛刺並整圓。(圖①)
2. 將螺帽(或法蘭蓋)套進管材後，張開鉗口，把鉗口的圓下鉤伸進管內(圖②)，確認鉗口的底部緊貼管口後，用力抓緊鉗柄，管端即被鉗壓出標準的凸點。(圖③)
3. 將密封圈套進管材凸點的後面，確保密封圈包裹著凸點。(圖④)
4. 把管材和密封圈一起插進管內，逐漸擰緊螺帽，最後用扳手將頂帽收緊(或把法蘭蓋螺絲孔對準管件的螺絲孔後，將螺栓逐個擰進管件上，再用六角匙對角線逐個擰緊)。(圖④⑤)

注意：

1. 鉗凸點時不要在焊縫部位凸點，以免損傷焊縫。
2. 凸點的數量根據管徑的大小分為：(如右表)

口徑 (mm) Diameter	凸點數量 number of bump points
66.7 - 102	4點以上 - 4 or above
159	6點以上 - 6 or above
219 - 321	8點以上 - 8 or above

Bump Point Installation Method

1. Cut the pipe to a suitable length using a hand-cutter or a cutting machine. Remove any burrs and ensure the pipe edge is still circular. (photo 1)
2. Slip screw nut (or flange for flange type) onto pipe, open up the bump point press and insert the circular bottom of the press head inside the pipe. (photo 2) Ensure the bottom of the press is in contact with the pipe. Grip handles firmly and a standard bump will appear on the pipe end. (photo 3)
3. Slip the seal ring onto the pipe end. Ensure to cover the bumps with the seal ring. (photo 4)
4. Push pipe with the seal ring into the fitting. For the screw nut style fittings, tighten screw nut onto the fitting. Complete final tightening with a crescent wrench. (For flange style, Line up the flange and the fitting's screw holes, insert screws into holes and tighten screws with an Allen key. Tighten screws in a crisscross fashion) (photo 4 & 5)

Attention:

1. Do not create bump points on the weld seam of the pipe to avoid damaging the weld seam.
2. See Table 1 for the number of required bumps for different diameter pipes.

