HL CRYOGENIC EQUIPMENT

成都活力低温设备有限公司
CHENGDU HOLY CRYOGENIC EQUIPMENT CO.,LTD.

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VACUUM JACKETED PIPING

ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ
Интернет: www.tisys.ru www.tisys.kz www.tisys.by www.tesec.ru www.ти-системс.рф
Телефоны: +7 (495) 7774788, 7489626, (925) 5007155, 54, 65
Эл. почта: info@tisys.ru info@tisys.kz info@tisys.by

Vacuum Insulated Pipe (VI Piping), namely Vacuum Jacketed Pipe (VJ Piping) are used for transferring of liquid oxygen, liquid nitrogen, liquid argon, liquid hydrogen, liquid helium, LEG and LNG, as a Perfect substitute for conventional piping insulation.

1.Vacuum Insulated Piping

Vacuum Insulated Pipe (VI Piping), namely Vacuum Jacketed Pipe (VJ Piping), as a Perfect substitute for conventional piping insulation. Compared with conventional piping insulation, the heat leakage value of VIP is only 0.05~0.035 times of conventional piping insulation. Significantly save energy and cost for customers.

The product series of Vacuum Insulated Pipe, Vacuum Insulated Hose, Vacuum Insulated Valve, and Phase Separator in HL Cryogenic Equipment Company, which passed through a series of extremely strict technical treatments, are used for transferring of liquid oxygen, liquid nitrogen, liquid argon, liquid hydrogen, liquid helium, LEG and LNG, and these products are serviced for cryogenic equipment (e.g. cryogenic tank, dewar and coldbox etc.) in industries of air separation, gases, aviation, electronics, superconductor, chips, pharmacy, hospital, biobank, food & beverage, automation assembly, rubber, new material manufacturing chemical engineering, iron & steel, and scientific research etc.

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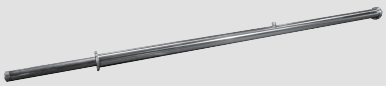
1.1.Three Connection Type of VIP/VJP

In order to maximize the different needs of customers, Vacuum Insulated Pipe has developed three connection types, namely Vacuum Bayonet Connection Type with Clamps, Vacuum Bayonet Connection Type with Flanges and Bolts and Welded Connection Type. They have different advantages and are suitable for different working conditions.

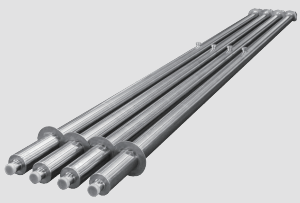
Scope of Application

	Vacuum Bayonet Connection Type with Clamps	Vacuum Bayonet Connection Type with Flanges and Bolts	Welded Connection Type
Connection Type	Clamps	Flanges and Bolts	Weld
Insulation Type at joints	Vacuum	Vacuum	Perlite or Vacuum
On-site Insulated Treatment	No	No	Yes, perlite filled into or vacuum pump out from the Insulated Sleeves at joints.
Nominal Diameter of Inner Pipe	DN10(3/8")~DN25(1")	DN10(3/8")~DN80(3")	DN10(3/8")~DN500(20")
Design Pressure	≤8 bar	≤16 bar	≤64 bar
Installation	Easy	Easy	Weld
Design Temperature	-196℃~ 60℃ (LH2 & LHe： -270℃ ~ 60℃)		
Length	1 ~ 8.2 meter/pcs		
Material	300 Series Stainless Steel		
Medium	LN_2, LOX, LAr, LHe, LH_2, LNG		

Vacuum Bayonet Connection Type with Clamps



Vacuum Bayonet Connection Type with Flanges and Bolts



Welded Connection Type

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1.2.DYNAMIC AND STATIC VACUUM INSULATED PIPING SYSTEM

Vacuum Insulated (VI) Piping System can be divided into Dynamic and Static VI Piping System.

- The Static VI Piping is fully completed in the manufacturing factory.
- The Dynamic VI Piping is offered a more stable vacuum state by a continuous pumping of vacuum pump system on site, and the rest of the assembly and process treatment is still in the manufacturing factory.

	Dynamic Vacuum Insulated Piping System	Static Vacuum Insulated Piping System
Introduction	The vacuum degree of the vacuum interlayer is monitored continuously, and the vacuum pump is automatically controlled to open and close, to ensure the stability and effectiveness of vacuum degree	VJPs complete the vacuum insulation work in the manufacturing plant.
Advantages	The vacuum retention is more stable, basically eliminate the vacuum maintenance in the future working.	More economical investment and simple on-site installation
Vacuum Bayonet Connection Type with Clamps	Applicative	Applicative
Vacuum Bayonet Connection Type with Flanges and Bolts	Applicative	Applicative
Welded Connection Type	Applicative	Applicative

Dynamic Vacuum Insulated Piping System: Consist of Vacuum Insulated Pipes, Jumper Hoses and Vacuum Pump System (including the vacuum pumps, solenoid valves and vacuum gauges).

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2.SPECIFICATION AND MODEL

HL-PX-X-000-00-X

Brand	Description	Connection Type
HL Cryogenic Equipment	PD: Dynamic VI Pipe PS: Static VI Pipe	W: Welded Type B : Vacuum Bayonet Type with Clamps F : Vacuum Bayonet Type with Flanges and Bolts

Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe
010: DN10 ... 080: DN80 ... 500: DN500	08: 8bar 16: 16bar 25: 25bar 32: 32bar 40: 40bar	A: SS304 B: SS304L C: SS316 D: SS316L E: Other

3.PRODUCT SELECTION TABLE

3.1 Static Vacuum Insulated Pipe

3.1.1 Vacuum Bayonet Connection Type with Clamps

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPSB01008X	Vacuum Bayonet Connection Type with Clamps for Static Vacuum Insulated Pipe	DN10, 3/8"	8 bar	300 Series Stainless Steel	ASME B31.3	X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPSB01508X		DN15, 1/2"				
HLPSB02008X		DN20, 3/4"				
HLPSB02508X		DN25, 1"				

Nominal Diameter of Inner Pipe: Recommended ≤ DN25 or 1". Or selects the Vacuum Bayonet Connection Type with Flanges and Bolts (from DN10, 3/8" to DN80, 3"), Welded Connection Type VIP (from DN10, 3/8" to DN500, 20")

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Design Pressure: Recommended ≤ 8 bar. Or selects the Vacuum Bayonet Connection Type with Flanges and Bolts (≤16 bar), Welded Connection Type (≤64 bar)

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

3.1 Static Vacuum Insulated Pipe

3.1.2 Vacuum Bayonet Connection Type with Flanges and Bolts

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPSF01000X	Vacuum Bayonet Connection Type with Flanges and Bolts for Static Vacuum Insulated Pipe	DN10, 3/8"	8~16 bar	300 Series Stainless Steel	ASME B31.3	00: Design Pressure. 08 is 8bar, 16 is 16bar. X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPSF01500X		DN15, 1/2"				
HLPSF02000X		DN20, 3/4"				
HLPSF02500X		DN25, 1"				
HLPSF03200X		DN32, 1-1/4"				
HLPSF04000X		DN40, 1-1/2"				
HLPSF05000X		DN50, 2"				
HLPSF06500X		DN65, 2-1/2"				
HLPSF08000X		DN80, 3"				

Nominal Diameter of Inner Pipe: Recommended ≤ DN80 or 3". Or selects the Welded Connection Type (from DN10, 3/8" to DN500, 20"), Vacuum Bayonet Connection Type with Clamps (from DN10, 3/8" to DN25, 1").

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Design Pressure: Recommended ≤ 16 bar. Or selects Welded Connection Type (≤64 bar).

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

3.1 Static Vacuum Insulated Pipe

3.1.3 Welded Connection Type

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPSW01000X	Welded Connection Type for Static Vacuum Insulated Pipe	DN10, 3/8"	8~64 bar	300 Series Stainless Steel	ASME B31.3	00: Design Pressure 08 is 8bar, 16 is 16bar, and 25, 32, 40, 64. X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPSW01500X		DN15, 1/2"				
HLPSW02000X		DN20, 3/4"				
HLPSW02500X		DN25, 1"				
HLPSW03200X		DN32, 1-1/4"				
HLPSW04000X		DN40, 1-1/2"				
HLPSW05000X		DN50, 2"				
HLPSW06500X		DN65, 2-1/2"				
HLPSW08000X		DN80, 3"				
HLPSW10000X		DN100, 4"				
HLPSW12500X		DN125, 5"				
HLPSW15000X		DN150, 6"				
HLPSW20000X		DN200, 8"				
HLPSW25000X		DN250, 10"				
HLPSW30000X		DN300, 12"				
HLPSW35000X		DN350, 14"				
HLPSW40000X		DN400, 16"				
HLPSW45000X		DN450, 18"				
HLPSW50000X		DN500, 20"				

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

3.2 Dynamic Vacuum Insulated Pipe

3.2.1 Vacuum Bayonet Connection Type with Clamps

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPDB01008X	Vacuum Bayonet Connection Type with Clamps for Dynamic Vacuum Insulated Pipe	DN10, 3/8"	8 bar	300 Series Stainless Steel	ASME B31.3	X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPDB01508X		DN15, 1/2"				
HLPDB02008X		DN20, 3/4"				
HLPDB02508X		DN25, 1"				

Nominal Diameter of Inner Pipe: Recommended ≤ DN25 or 1". Or selects the Vacuum Bayonet Connection Type with Flanges and Bolts (from DN10, 3/8" to DN80, 3"), Welded Connection Type VIP (from DN10, 3/8" to DN500, 20")

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Design Pressure: Recommended ≤ 8 bar. Or selects the Vacuum Bayonet Connection Type with Flanges and Bolts (≤16 bar), Welded Connection Type (≤64 bar)

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

Power Condition: The site needs to supply power to the vacuum pumps and inform HL Cryogenic Equipment the local electricity information (Voltage and Hertz)

3.2 Dynamic Vacuum Insulated Pipe

3.2.2 Vacuum Bayonet Connection Type with Flanges and Bolts

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPDF01000X	Vacuum Bayonet Connection Type with Flanges and Bolts for Dynamic Vacuum Insulated Pipe	DN10, 3/8"	8~16 bar	300 Series Stainless Steel	ASME B31.3	00: Design Pressure. 08 is8bar, 16 is 16bar. X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPDF01500X		DN15, 1/2"				
HLPDF02000X		DN20, 3/4"				
HLPDF02500X		DN25, 1"				
HLPDF03200X		DN32, 1-1/4"				
HLPDF04000X		DN40, 1-1/2"				
HLPDF05000X		DN50, 2"				
HLPDF06500X		DN65, 2-1/2"				
HLPDF08000X		DN80, 3"				

Nominal Diameter of Inner Pipe: Recommended ≤ DN80 or 3". Or selects the Welded Connection Type (from DN10, 3/8" to DN500, 20"), Vacuum Bayonet Connection Type with Clamps (from DN10, 3/8" to DN25, 1").

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Design Pressure: Recommended ≤ 16 bar. Or selects Welded Connection Type (≤64 bar).

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

Power Condition: The site needs to supply power to the vacuum pumps and inform HL Cryogenic Equipment the local electricity information (Voltage and Hertz)

3.2 Dynamic Vacuum Insulated Pipe

3.2.3 Welded Connection Type

Model	Connection Type	Nominal Diameter of Inner Pipe	Design Pressure	Material of Inner Pipe	Standard	Remark
HLPDW01000X	Welded Connection Type for Dynamic Vacuum Insulated Pipe	DN10, 3/8"	8~64 bar	Stainless Steel 304, 304L, 316, 316L	ASME B31.3	00: Design Pressure 08 is8bar, 16 is16bar, and 25, 32, 40, 64.. X: Material of Inner Pipe. A is 304, B is 304L, C is 316, D is 316L, E is other.
HLPDW01500X		DN15, 1/2"				
HLPDW02000X		DN20, 3/4"				
HLPDW02500X		DN25, 1"				
HLPDW03200X		DN32, 1-1/4"				
HLPDW04000X		DN40, 1-1/2"				
HLPDW05000X		DN50, 2"				
HLPDW06500X		DN65, 2-1/2"				
HLPDW08000X		DN80, 3"				
HLPDW10000X		DN100, 4"				
HLPDW12500X		DN125, 5"				
HLPDW15000X		DN150, 6"				
HLPDW20000X		DN200, 8"				
HLPDW25000X		DN250, 10"				
HLPDW30000X		DN300, 12"				
HLPDW35000X		DN350, 14"				
HLPDW40000X		DN400, 16"				
HLPDW45000X		DN450, 18"				
HLPDW50000X		DN500, 20"				

Nominal Diameter of Outer Pipe: Recommended by the Enterprise Standard of HL Cryogenic Equipment. It also can be produced according to requirement of the customer.

Material of Outer Pipe: Without special requirement, the material of inner pipe and outer pipe will be selected the same.

Power Condition: The site needs to supply power to the vacuum pumps and inform HL Cryogenic Equipment the local electricity information (Voltage and Hertz)