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Catalog No. H-500PIT
Nov. 2013

Pre-Insulated Tubing

size from 1/4" thru 3/4" (6mm thru 20mm)



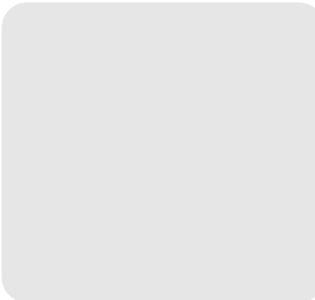
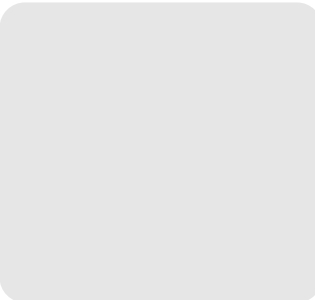
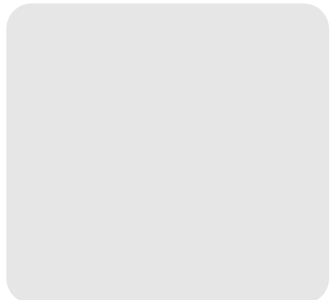
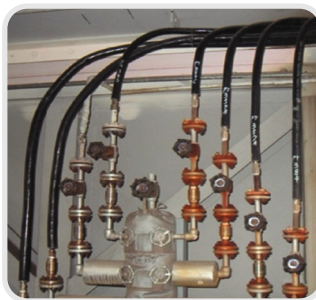
HY-LOK CORPORATION

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인증서 (Certification)



- ❑ ISO 9001
- ❑ ISO 14001
- ❑ Patent 10 - 0994986
- ❑ GS Caltex - 승인 제조 업체
- ❑ BV (Bureau Veritas) - Pipe / Tube and Fittings



특징

우수한 용접성

부압 장치를 포함한 케이싱 내 진공 이중 용접으로
기존 제품 단점 보완

완벽한 내면 비드 처리

롤 압연 및 플러그 인발공정으로 용접비드를
완벽히 제거하여 정밀한 외경과 두께 관리

용접 응력 제거

인발과 열처리를 통해 용접응력의 완전제거 및
우수한 조도 개선

철저한 품질 관리

조관 용접에서 비파괴 전수검사까지 일괄생산 체제에
의한 균일한 품질 유지

사용 범주

- 석유화학, 제지, 기계 설비
- 조선, 발전설비
- 항공기, 자동차, 기계부품 및 구조물
- 보일러, 열교환기

Features

Excellent Weldability

When complementary existing goods fault,
Negative pressure device welded Dual vacuum

Perfect Inner Bead Handling

Roll rolling and plug drawing process completely remove weld bead.
It can control Accurate external diameter or thickness

Eliminating Welding Stress

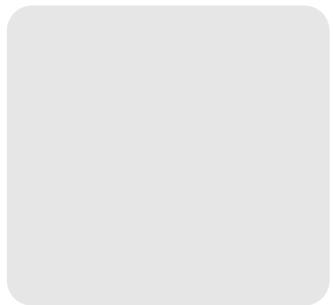
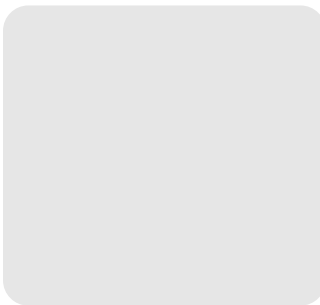
Through Drawing and heat treatment, It Perfectly eliminating
Welding stress and improving excellent illuminance.)

Thoroughly Quality Management

From pipe welding to total non-destructive inspection maintain
consistent quality by integrated production system

Range of Use

- Petrochemistry, Paper manufacture, Machine & Equipment
- Shipbuilding, Power plants
- Aircraft, Automobiles, Machine parts & Construction.
- Boilers, Heat exchangers



Pre-Insulated Tubing

Semi - Seamless Tubing

화학 성분 [Chemical Composition(According to ASTM A269 / A213)]

기호	C (MAX)	Mn (MAX)	P (MAX)	S (MAX)	Si (MAX)	Ni	Cr	Mo	The others
TP304	0.080	2.00	0.045	0.03	1.00	8.00 ~ 11.00	18.0 ~ 20.0	-	-
TP304L	0.035	2.00	0.045	0.03	1.00	8.00 ~ 12.00	18.0 ~ 20.0	-	-
TP316	0.080	2.00	0.045	0.03	1.00	10.00 ~ 14.00	16.0 ~ 18.0	2.0 ~ 3.0	-
TP316L	0.035	2.00	0.045	0.03	1.00	10.00 ~ 14.00	16.0 ~ 18.0	2.0 ~ 3.0	-
TP321	0.080	2.00	0.045	0.03	1.00	9.00 ~ 12.00	17.0 ~ 19.0	-	5(C+N) ~ 0.9

기계적 특성 [Mechanical Properties]

기 호	Tensile Strength (Min) (Mpa)	Yield Strength (Min) (Mpa)	Elongation(%) (Gauge Length 2 in) Min		Hardness (Maximum value)		
			Tubular form Test piece	Strip specimen		Brinell	Rockwell
				1 ≥ 5/16in	1 < 5/16in		
TP304	515	205	35	35	192	B90	
TP304L	485	170	35	35	192	B90	
TP316	515	205	35	35	192	B90	
TP316L	485	170	35	35	192	B90	
TP321	515	205	35	35	192	B90	

허용 공차 [Permissible Variations in Dimensions]

Spec.	Outside Diameter		Wall Thickness	
	Size (mm)	Tolerance (mm)	Size (mm)	Tolerance (% , mm)
A269	up to 1.27	±0.10	up to 1.27	± 15
	1.27 to 3.81(excl.)	±0.13	1.27 to 3.81(excl.)	± 10
	38.1 to 88.9(excl.)	±0.25	38.1 to 88.9(excl.)	± 10
A213	Under 25.4	+0.1 / -0.11	Under 38.1(incl.)	+20 / -0
	25.4 to 38.1	±0.15	(Welded - All Size)	(+18 / -0)

표면 조도 [Surface Roughness]

공법	내부 표면 조도값(μinch)	
	RA	RA
AP	≤40	≤120
BA	≤15	≤45
EP	≤10	≤30

시공효과 비교

Piping & Field Insulation vs Pre-insulated Tube 시공 및 효과 비교
 Comparison of the install or effect between Piping & Field Insulation and Pre-insulated Tube

Piping & Field Insulation

- Insulation의 노후 및 관리 부실의 경우, 비, 물, 습기침투
- 외부온도 유입으로 따른 내부 온도하락현상으로 Trap의 빈번한 작동으로 인한 Steam의 손실이 생긴다.
- 보일러의 용량 과부하로 이어짐.
- Water Hammer현상이 일어나기 쉬움.
- If Insulation gets old and management of non-performing, It can permeate rain, water, moisture.
- The influx of outside temperature can cause temperature drop phenomenon.
- It is occurred steam loss due to frequent operate trap.
- to overload the capacity of the boiler.
- to easy happen Water Hammer phenomenon.

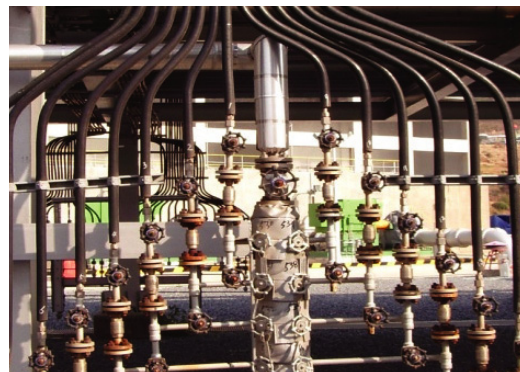
Pre-insulated Tubing

- 기존 공법 대비 3배이상 빠른 시공률(공기단축)
- PVC Jacket의 완벽한 방수 / 기밀성 / 보온 / 보냉으로 추후 유지보수 불필요
- Tracing Line의 두께 절감으로 인한 공정 내 시야 확보 공간 절감
- 보온작업으로 인한 분진 및 작업장내 유해환경 제거
- 안정된 보온 기능으로 인한 Energy Save효과
- Support Welding Point에 인한 Heat Loss 및 외부온도 유입 틈새 제거
- 에너지 절감 (보일러 가동률 우기 시 40%가량, 평상 시 3~4%)
- 재사용 가능 (폐기물 절감, 20년이상 상용 가능, 친환경 소재 사용)
- 자외선 차단 (UV코팅)
- 내부 Scale 적층 최소화
- Construction rate is three times faster than existing method of construction (reduced the construction period).
- PVC jacket of Perfect waterproofing / airtightness / heat reserving / cold reserving function is unnecessary it no more additional maintenance.
- Security of sight's space in the process is reduced by cut of Tracing Line's thickness.
- Remove dust and harmful environment in the workplace through keep-warm operation.
- Effect of Energy save though stable keep-warm function.
- remove heat loss and the cracks of outside temperature's incoming by Support Welding Point Heat.
- Energy saving (40% operating rate of boiler at rainy season, 3~4% in usual.
- Reusable (waste reduction, commercially available for more than 20 years, using eco-friendly material).
- Block ultraviolet (UV coating)
- To minimize internal Laminated Scale

시공사진 비교

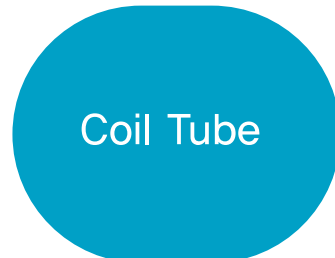
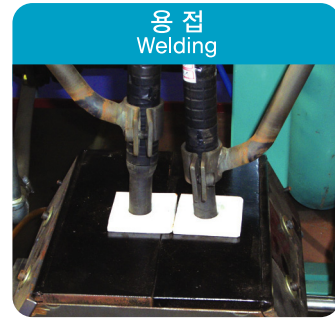


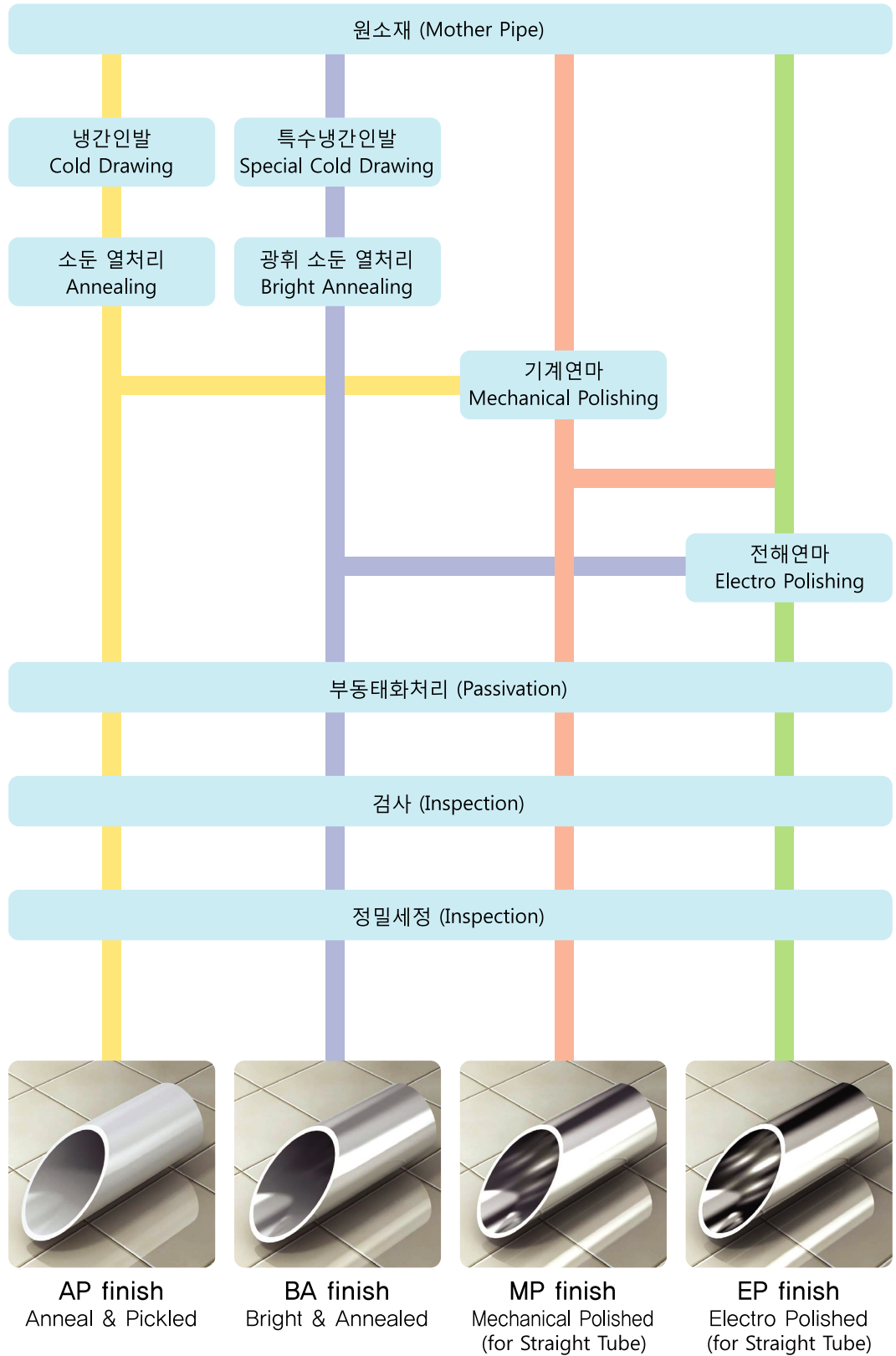
Piping & Field Insulation



Pre-Insulated Tube

제조 공정도 (Manufacturing Process)





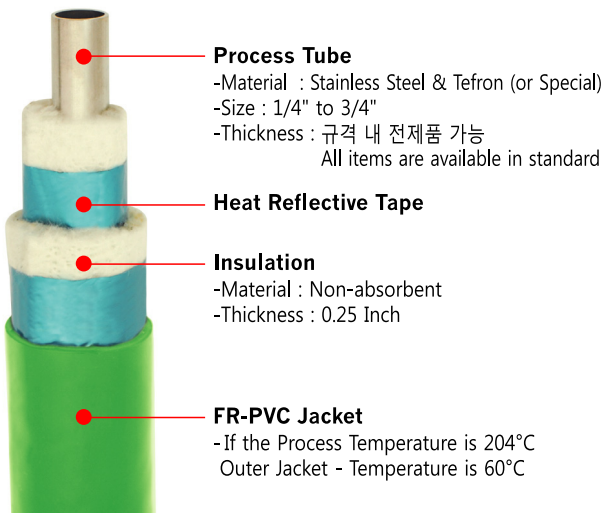
Pre-Insulated Tube

* 직관 튜브의 MP 혹은 EP후처리 제품은 하이록코리아 본사 또는 대리점으로 문의하십시오
 * Please send inquiry to Hy-Lok headquarter or region representatives about MP or EP finished straight tubing.

Pre-Insulated Tube

정의

- 미리 보온 및 절연공정을 거쳐 별도의 Field Insulation 작업이 불필요한 Tube
- Pre-Insulated Tube는 무기 유리섬유로 만들어지며 표면은 유연성이 좋은 내열 PVC로 되어 있다.
- 204°C까지 액체나 가스전달이 가능하며 이때 표면온도는 60°C 유지 가능하며 별도 요청 시 649°C까지 유지 가능하다.
- 경제적이고 고효율 제품으로 설계되어 있으며, 일반적으로 열배관, 응축액순환배관, 냉각라인, 주유, 냉장, 액체질소등에 사용 가능하며, Tube배관소재는 304,304L,316,316L 등이 사용되며, 기타 강종은 주문 생산가능.



Definition

- Tube through ready heat tracing and insulation process is unnecessary that separate field insulation process
- Pre-Insulated Tube is made of inorganic glass fiber. It's surface consists of heat-resisting PVC Which is well-flexible.
- It is possible to deliver fluid or gas to 204°C. At this time, the surface temperature can maintain up to 60°C. In the case of special requests, The surface temperature can be up to 649°C.
- Products are designed with economical and high efficient. In general, Those are available at heat pipes, condensate circulation pipe, cooling lines, lubrication, refrigeration, liquid nitrogen, etc. Tube pipe material is used to 304,304L,316,316L. other steels are available upon request.

Specification

Available Standard Tube Diameters	1/4", 3/8", 1/2", 5/8", 3/4"
Available Standard Tube Materials	Copper and Stainless Steel etc.
Maximum Process Tube Temperature	204°C
Maximum Outer Jacket Temperature	60°C
Maximum Installation Temperature	-40°C
Maximum Recommended Steam Temperature	250psi (1,825kPa)

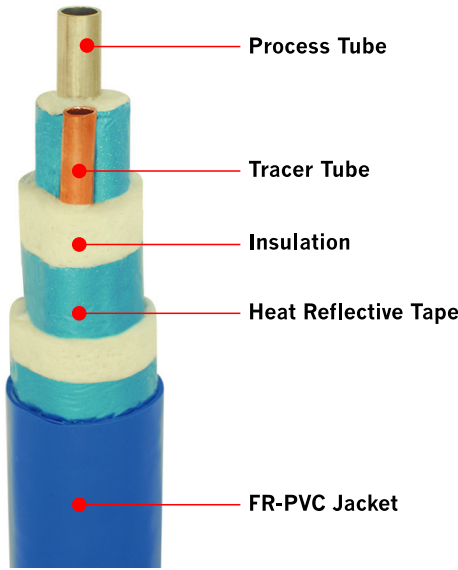
Ordering Information

T	8T	35	A	1	P	G	S316
Tube	Process Tube Size	Process Tube Wall Thickness	Surface	Number of Process Tube	FR PVC	Jacket Color	Process Tube Material
	<ul style="list-style-type: none"> • 4T : 1/4" • 6T : 3/8" • 8T : 1/2" • 10T : 5/8" • 12T : 3/4" • 6M : 6mm • 8M : 8mm • 10M : 10mm • 12M : 12mm • 15M : 15mm 	<ul style="list-style-type: none"> • 28 : 0.028" • 30 : 0.030" • 32 : 0.032" • 35 : 0.035" • 40 : 0.040" • 47 : 0.047" • 49 : 0.049" • 50 : 0.050" • 05 : 0.5mm • 08 : 0.8mm • 10 : 1.0mm • 12 : 1.2mm • 15 : 1.5mm 	<ul style="list-style-type: none"> • A : AP • B : BA • Z : Random 	<ul style="list-style-type: none"> • 1 : 1Tube • 2 : 2Tube • 3 : 3Tube 		<ul style="list-style-type: none"> • Nil : Black • B : Blue • G : Green • Y : Yellow • P : Purple • R : Red • W : White 	<ul style="list-style-type: none"> • CU : Copper • S316 : TP316 • 316L : TP316L • S304 : TP304 • 304L : TP304L • PTFE : PTFE

Light Steam Trace

정의

- Light Steam Tracer Tube는 비흡수성 유리섬유 한 개 혹은 몇 개의 튜브를 절연처리하여 외부에 난연, 불연성 PVC재킷을 사용하며 내부 최대 노출 온도는 204°C이다.



Definition

- Light Steam Tracer tube is made of a single non-absorbent glass fiber and multiple insulation to use non-flammable glass fiber. The maximum internal exposure temperature is 204°C

적용 / Applications

유체 또는 온도에 예민한 화학품 이송용 기기라인, 동파방지 및 점도유지에 사용.
Fluid or sensitive temperature devices is used for chemical feed lines, freeze protection and viscosity maintenance.

튜브(소재) / Tube(Material)

동관, 심레스 및 304/304L 용접관을 주로 사용.
요구에 따라 기타재질 사용가능 (튜브 관련 소재 규격은 카탈로그 참조)
Tube Mainly use copper tubes, seamless, 304, 316L welded pipes.
Other materials are available upon request.
(Tube-related specifications in the catalog reference)

절연 / Insulation

비흡수성 유리섬유로 온도손실 최대방지.
Non-absorbent glass fiber prevent The most temperature loss.

재킷 / Jacket

난연 불연성 PVC로 부식, 물, 오일, 산, 알칼리 또는 대부분 화학물질에 강함.
Non-flammable PVC offers high resistance to corrosion, water, oil, acid, alkali and most of chemicals.

Ordering Information

T	8T	35	6T	35	A	2	P	R	H	S6	CU
Tube		Process Tube Wall Thickness		Tracer Tube Wall Thickness	Surface	Number of Process Tube	FR PVC	Jacket Color	Bundle Type	Process Tube Material	Tracer Tube Material
		<ul style="list-style-type: none"> • 28 : 0.028" • 30 : 0.030" • 32 : 0.032" • 35 : 0.035" • 40 : 0.040" • 47 : 0.047" • 49 : 0.049" • 50 : 0.050" 		<ul style="list-style-type: none"> • 28 : 0.028" • 30 : 0.030" • 32 : 0.032" • 35 : 0.035" • 40 : 0.040" • 47 : 0.047" • 49 : 0.049" • 50 : 0.050" 	<ul style="list-style-type: none"> • A : AP • B : BA • Z : Random 	<ul style="list-style-type: none"> • 1 : 1 Tube • 2 : 2 Tube • 3 : 3 Tube 		<ul style="list-style-type: none"> • Nil : Black • B : Blue • G : Green • Y : Yellow • P : Purple • R : Red • W : White 	<ul style="list-style-type: none"> • L : Light Steam 	<ul style="list-style-type: none"> • CU : Copper • S6 : TP 316 • 6L : TP 316L • S4 : S304 • 4L : 304L • PT : PTFE 	<ul style="list-style-type: none"> • CU : Copper • S6 : TP 316 • 6L : TP 316L • S4 : S304 • 4L : 304L • PT : PTFE
	Process Tube Size		Tracer Tube Size								
	<ul style="list-style-type: none"> • 4T : 1/4" • 6T : 3/8" • 8T : 1/2" • 10T : 5/8" • 12T : 3/4" 		<ul style="list-style-type: none"> • 4T : 1/4" • 6T : 3/8" • 8T : 1/2" • 10T : 5/8" • 12T : 3/4" 								

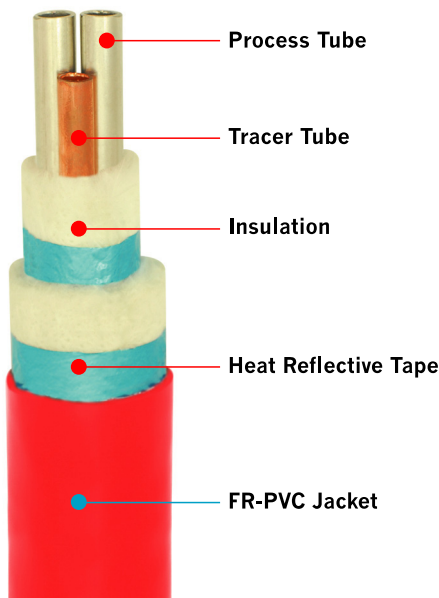
Heavy Steam Trace

정의

- Heavy Steam Tracer Tube는 비흡수성 유리섬유 한 개 혹은 몇 개의 튜브를 절연 처리하여 외부에 난연, 불연성 PVC재킷을 사용하며 내부 최대 노출온도는 204°C이다.

Definition

- Heavy Steam Tracer tube is used to a single non-absorbent glass fiber and multiple insulation using flame resistance PVC jacket. The maximum internal exposure temperature is 204°C



적용 / Applications

온도 증가에 필요한 고온스팀, 압력이송 및 기름혹 증류액 가스증기 이송에 사용
It is Used to high temperature steam, pressure, oil bumps, distillates or gas transmission to require Temperature increase.

튜브(소재) / Tube(Material)

동관, 심레스 및 304/316L용접관을 주로 사용, 요구에 따라 기타재질 사용가능 (튜브 관련 소재 규격은 카탈로그 참고)
Tube Mainly use copper tubes, seamless, 304, 316L welded pipes. Other materials are available upon request. (Tube-related specifications in the catalog reference)

절연 / Insulation

비흡수성 유리섬유로 온도손실 최대 방지
Non-absorbent glass fiber prevent The most temperature loss.

재킷 / Jacket

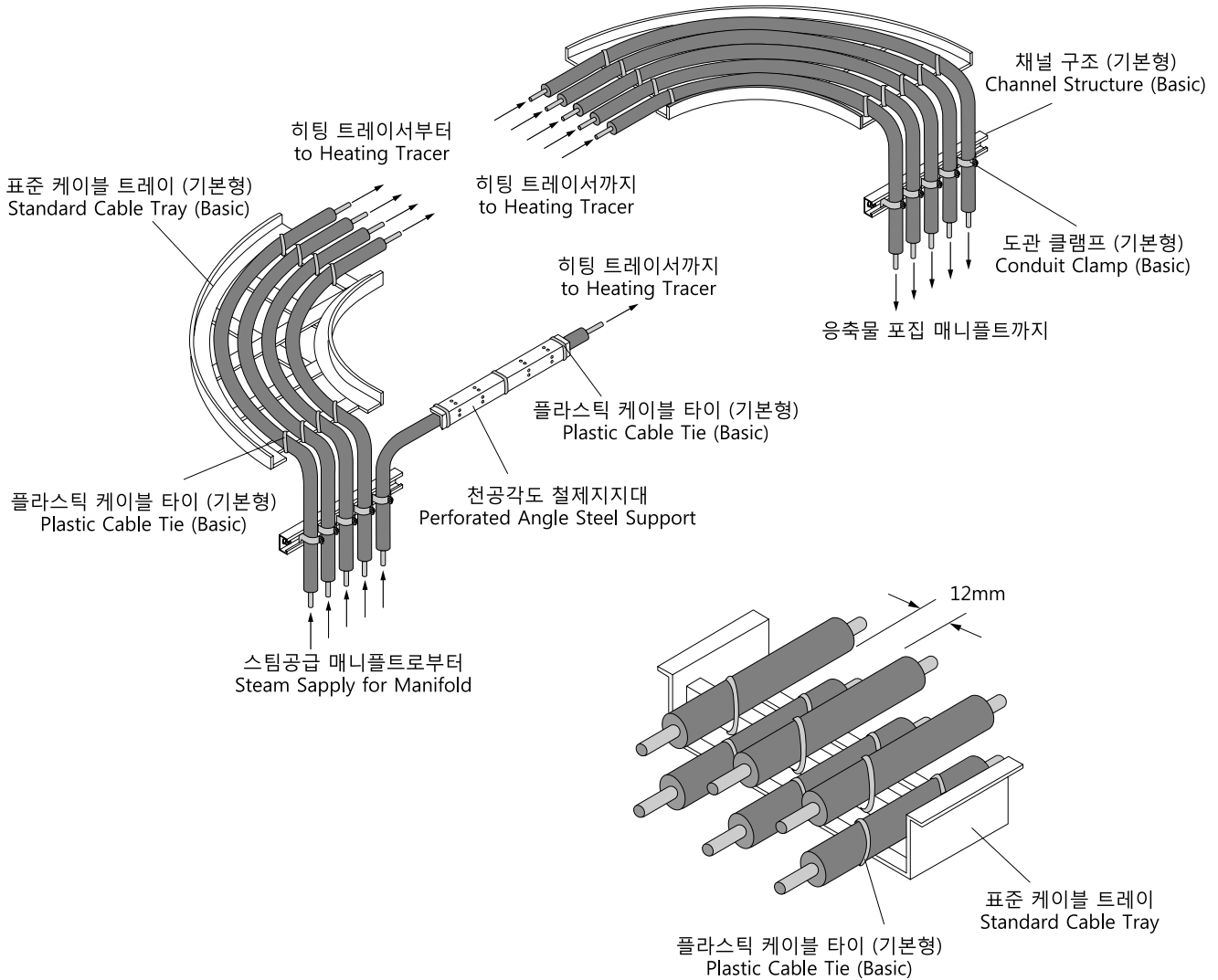
난연 불연성 PVC로 부식, 물, 오일, 산, 알칼리 또는 대부분 화학물질에 강함.
Non-flammable PVC offers high resistance to corrosion, water, oil, acid, alkali and most of chemicals.

Ordering Information

T	8T	35	6T	35	A	2	P	R	H	S6	CU
Tube	Process Tube Wall Thickness	Tracer Tube Wall Thickness	Number of Process Tube	Jacket Color	Process Tube Material						
	<ul style="list-style-type: none"> • 28 : 0.028" • 30 : 0.030" • 32 : 0.032" • 35 : 0.035" • 40 : 0.040" • 47 : 0.047" • 49 : 0.049" • 50 : 0.050" 	<ul style="list-style-type: none"> • 28 : 0.028" • 30 : 0.030" • 32 : 0.032" • 35 : 0.035" • 40 : 0.040" • 47 : 0.047" • 49 : 0.049" • 50 : 0.050" 	<ul style="list-style-type: none"> • 1 : 1 Tube • 2 : 2 Tube • 3 : 3 Tube 	<ul style="list-style-type: none"> • Nil : Black • B : Blue • G : Green • Y : Yellow • P : Purple • R : Red • W : White 	<ul style="list-style-type: none"> • CU : Copper • S6 : TP 316 • 6L : TP 316L • S4 : S304 • 4L : 304L • PT : PTFE 						
Process Tube Size	Tracer Tube Size	Surface	FR PVC	Bundle Type	Tracer Tube Material						
<ul style="list-style-type: none"> • 4T : 1/4" • 6T : 3/8" • 8T : 1/2" • 10T : 5/8" • 12T : 3/4" 	<ul style="list-style-type: none"> • 4T : 1/4" • 6T : 3/8" • 8T : 1/2" • 10T : 5/8" • 12T : 3/4" 	<ul style="list-style-type: none"> • A : AP • B : BA • Z : Random 		<ul style="list-style-type: none"> • H : Heavy Steam 	<ul style="list-style-type: none"> • CU : Copper • S6 : TP 316 • 6L : TP 316L • S4 : S304 • 4L : 304L • PT : PTFE 						

Tubing Installation

기본적인 도관 번들 설치 / Installation of Basic Tubing Bundles



기본적인 케이블 트레이 설치

- 튜브서포트를 위한 케이블 트레이, 앵글, I-Beam을 설치하고, 유지보수를 위하여 라인 사이에 최소 12mm의 공간을 확보한다.
- 종료시 Trapping water를 방지하기 위하여 트레이서를 약간의 경사를 유지한다.
- 튜브의 안정적인 지지를 위해 수평으로는 1.5~1.8M, 수직으로는 3.0~4.6M마다 고정 시키고, 추가지지대는 피팅이나 연결지점의 약 460mm이내에 설치한다.
- 케이블 트레이와 채널 스트리트는 튜브의 다중경로를 위해 최적의 지지대가 설치되어야 한다.
- 옵션으로 철제앵글은 긴수평과 수직의 튜브지지를 위해 사용할 수 있다.
- 철제앵글의 치수는 튜브의 외경보다 12mm커야하고 앵글을 튜브위에 설치하여 습기발생을 방지해야 한다.
- 앵글은 UV저항케이블타이 또는 스테인리스스틸 밴딩을 사용해야 한다.

Installation of Basic Cable tray..

- It install cable trays, angles, I-beam to support tube. In order to maintenance, It gain A minimum space of 12mm between the lines.
- To avoid trapping water during shutdown, Tracer maintains a slight incline.
- In order to support Tube, The cable trays fixed each of 1.5~1.8M horizontally and each of 3.0~4.6M vertically. additional supporters for a fitting or connection points are installed within approximately 460mm.
- In order to multi-path of the Tube, Cable trays and channel Streets should be installed the optimal supporters.
- Optional steel angle can be used to support long vertical and horizontal tubes.
- Its size should be 12mm bigger than tube diameter. and angle on the Tube should be placed to prevent moisture infiltration.
- Angle should be used UV resistant cable ties or stainless steel bending.

Pre-Insulated Tube 응용 제품

Light-Steam

한 개 또는 여러 개의 절연튜브로 구성되며, 고열압배관, 기름, 등유관 등 열에 민감한 라인에 적용.

Heavy-Steam

유리 섬유재질의 트레이서가 있으며 고열시스템에 사용된다. 기름, 증류관, 가스라인, 증기라인 등에 적용.

Steam-Line

습기에 강한 무기섬유로 만들어지며, 유연성이 좋은 내열 PVC 표면을 가진 절연튜브로/ 204°C까지의 액체나 가스를 전달 가능하며, 이때 표면온도는 60°C유지가능.

Sealing

Field 작업 시 외부 수분이 침투하는 것을 방지하기 위해 Pre-Insulated Tube의 절단 부위에 연결.

Applied products (Pre-Insulated Tube applications)

Light-Steam

It consists of a single or multiple insulation tubes. And applies to high temperature pressure tubing, oil, kerosene tubing, etc. of heat-sensitive lines.

Heavy-Steam

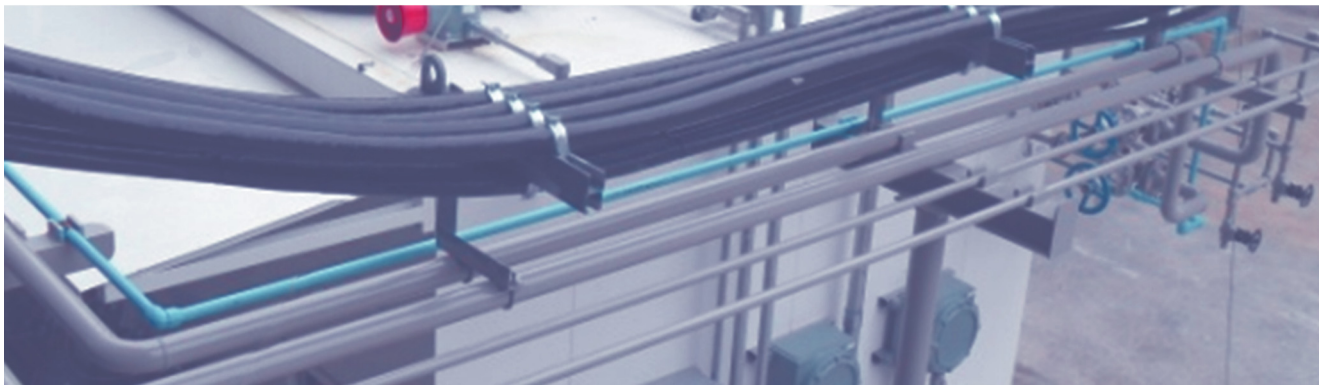
Fiberglass tracers are used in high-temperature systems. And applies to oil, distillation tubing, gas line, vapor line.

Steam-Line

It is made of inorganic fibers to resistant moisture, flexible, heat-resistant PVC surface with good insulation tube. and the liquid or gas is possible to be delivered up to 204°C. at this time, the surface temperature is possible to be maintained at 60 °C.

Sealing

To protect against outside moisture ingress at the field work, Pre-insulated tube connect to the cutting area.



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