

www.dongnamkorea.com

Tube specialized manufacturer from materials  
of seamless stainless (special alloy) pipe  
Tube sheath coating with synthetic resin  
(FRPVC, PU, PE, XLPE) total solution

## **DNK** *Products*



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## We promise you to provide the best-quality product through development of a new technology.

Since our establishment in 2000, DongnamKorea has been carrying out all our responsibility as a business partner through strict quality control system and quality certification such as ISO9001, ISO14001 & ISO 45001 approved by ABS and all other globally well-known classification.

We have become a leader in the field of Precision tube industry supplying 'Tube & Coil Product' such as Seamless Tube, Jacket Tube, Multi Core Tube and other fittings.

We promise our customers that we will supply the "Best-Quality" products through continuous development of our facilities and technology.

President. Tae sik, Tak



## Dong Nam Total Solution

# History

### 2000

Changed the name of Dongnam Precision Co., Ltd. and converted into corporation(Relocated to Noksan National Industrial Complex)

### 2001

ISO 9001 certified (DNV)

Cable Band & Buckle Classification (LR)

Contracted with MITUBISHI in Japan (SUS STRAP, PUMP TOWER, LNG Etc.)

### 2002

Samsung Heave Industries Minoan HAND RAIL Production & Installation

### 2003

Welding specialization factory approval (DNV.GL)

### 2004

BV Type Approval of Cable Binding Tape

CABLE TRAY Classification CSA 20C Certification

### 2005

Certified as an affiliated research institute - Korea Industrial Technology Promotion Association

ISO 14001 certification

First application of DALIA Cable Tray powder coating

### 2006

Supplied LNGC Gas Dome Ass'y (china)

Busan small business

Awarded the 7th Technology Innovation Competition

### 2007

Awarded the 3 Million Dollar Export Tower

### 2008

ISO9001 / ISO14001 Certificate renewal (DNV-REV.8)

Exported Band Hoop to USA (UL certified)

### 2010

Achilles JQS certified by GOST in Russia

Won a prize of five million dollars export

17th Corporate Innovation Award- Gold Prize for Corporate Innovation (Prime Minister's Award)- Best CEO Award

### 2012

Recognized as a winner of the national small business competition

<Awarded the prime minister, a model small business >

SHI JSM FPU

### 2013

Changed company name to DPI Co., Ltd. Transferred Mieumsandan Factory

Powder coating plant and liquid painting, stocking house expansion

### 2014

SHI ICHTHYS project ( Sus E&I Seat )

SHI STENA Project ( Seat, Pipe Sup't )

SHI CAT-J Project ( Seat, Pipe Sup't )

### 2015

SHI PETRONAS Project ( Pipe sup't )

### 2016

Changed company name to DONGNAMKOREA Co.,Ltd.

SHI APPOMATTOX Project (Pipe sup't)

**2017 / Product Service Change**

Built Seamless Tube production lines

Built Smart Factory MES system

Completed Samsung Heavy Industries manufacturing field innovation activities

### 2018

TUV PED 2014/68/EU Certification

(European Pressure vessel certification)

RMRS MCT Factory approval

ISO9001 / 14001 : 2015 UPGRADE (ABS)

SHI MD2 Project (Pipe sup't, Duct)

SWS SBM Project(MCT, Seamless Tube)

### 2019

SHI ENI Project (MCT, Seamless Tube)

### 2020

ISO45001:2018 Upgrade (ABS)

CMHI SBM Project(MCT, Seamless Tube)

SHI RELIANCE Project(MCT, Seamless Tube)

CIMC STOLT-NIELSEN GAS B.V.(MCT, Seamless Tube)



### Head Office

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Dong Nam Total Solution

# Certificate



ISO9001



ISO14001



ISO45001



Product Items

# Seamless Coil Tube

## ► Specific Applications

- Hydraulic Power
- Single Transmission
- Monitoring and Control Equipment
- Injection Line
- Down-Hole Safety Valve Control

Our seamless coiled tubing is available in a number of high performance corrosion resistant stainless steel and high nickel alloys, including the 300 series Monel, Inconel, and Hastelloy, capable of withstanding a variety of severe environmental conditions. We specialize in manufacturing small diameter tubing ranging and variety of wall thicknesses. We can supply seamless coiled tubing in loose bulk wound coils, or level wound on various size reels.

## ► Seamless Control line tubing

Our Seamless control line tubing is drawn from seamless extruded tube hollows supplied by leading primary manufacturers to ensure absolute product safety and reliability. Our seamless control line tubing is one continuous length of tubing, completely free of any welded joints or seams. Long length coils reduce installation time and costs by eliminating the need for excessive joint preparation and fittings. Elimination of excessive fittings increases reliability and assures a leak-free system. We are capable of 100% hydro-testing each coil.

Alloy	PREN	Density		Application Alloy
		g/cm <sup>3</sup>	lb/cm <sup>3</sup>	
304	21	7.93	0.29	General good corrosion resistance grade
304L	21	7.93	0.29	Lower carbon than 304 impedes carbide precipitates in heat affected zone giving good weld ability. Reduced carbides also lowers susceptibility to intergranular corrosion
316	24	7.98	0.29	Alloyed with molybdenum which improves corrosion resistance in marine environments, chlorides, and biofouling. Excellent pitting corrosion resistance.
316L	24	7.98	0.29	Carbon content restricted, which impedes carbide precipitates in heat affected zone giving good weld ability. Reduced carbides also lowers susceptibility to intergranular corrosion

## ► Product Application

- Oil, Gas, Petrochemical, Desalination, Fertilizer & Chemical Industries
- Control & Instrumentation Industry (C&I)
- Process & Power Plants
- Valve Remote Control (VRC) Line System
- Deck Machinery Remote Control Line System
- Fixed Gas Detection Sensing Line
- Heat Tracing Line
- Pressure Sensing Line
- Sampling & Drain Line
- Tank Level & Draft Gauging System Line
- Fire Fighting System Control Line



AMERICAN BUREAU OF SHIPPING



BUREAU VERITAS



CHINA CLASSIFICATION SOCIETY



DET NORSKE VERITAS GERMANISCHER LLOYD



KOREAN REGISTER



LLOYD'S REGISTER



NIPPON KAJI KYOKAI



REGISTRO ITALIANO NAVALE



RUSSIAN MARITIME REGISTER OF SHIPPING



TECHNISCHER UBERWACHUNGS VERINE

## Stainless Steel Grade

### ▶ Chemical composition & Mechanical Property of Stainless Steel

Code	Standard	Chemical Composition								
		Steel Grade	C(max)	Si(max)	Mn(max)	P(max)	S(max)	Ni	Cr	Mo
304	ASTM	TP 304	0.080	1.00	2.00	0.045	0.030	8.00~11.00	18.00~20.00	-
	JIS	SUS 304	0.080	1.00	2.00	0.040	0.030	8.00~11.00	18.00~20.00	-
	DIN	1.4301	0.070	1.00	2.00	0.045	0.030	8.50~10.05	18.00~20.00	-
	AISI	304	0.080	1.00	2.00	0.045	0.030	8.50~10.50	17.00~20.00	-
304L	ASTM	TP 304L	0.035	1.00	2.00	0.045	0.030	8.00~12.00	18.00~20.00	-
	JIS	SUS 304L	0.030	1.00	2.00	0.040	0.030	9.00~13.00	18.00~20.00	-
	DIN	1.4306	0.030	1.00	2.00	0.045	0.030	10.00~12.50	18.00~20.00	-
	AISI	304L	0.030	1.00	2.00	0.045	0.030	10.00~12.50	18.00~20.00	-
316	ASTM	TP 316	0.08	1.00	2.00	0.045	0.030	11.00~14.00	16.00~18.00	2.00~3.00
	JIS	SUS 316	0.08	1.00	2.00	0.040	0.030	10.00~14.00	16.00~18.00	2.00~3.00
	DIN	1.4401	0.070	1.00	2.00	0.045	0.030	10.50~13.50	16.50~18.50	2.00~2.50
	AISI	316	0.08	1.00	2.00	0.045	0.030	10.00~14.00	16.00~18.00	2.00~3.00
316L	ASTM	TP 316L	0.035	1.00	2.00	0.045	0.030	10.00~15.00	16.00~18.00	2.00~3.00
	JIS	SUS 316L	0.030	1.00	2.00	0.040	0.030	12.00~16.00	16.00~18.00	2.00~3.00
	DIN	1.4404	0.030	1.00	2.00	0.045	0.030	11.00~14.00	16.50~18.50	2.00~2.50
	AISI	316L	0.030	1.00	2.00	0.045	0.030	10.00~14.00	16.00~18.00	2.00~3.00

### ▶ Mechanical Properties

Grade	UNS	Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Rockwell Hardness (Scale)
TP 304	S30400	min 205	min 515	min 35	Max. 90
TP 304L	S30403	min 170	min 485	min 35	Max. 90
TP 316	S31600	min 205	min 485	min 35	Max. 90
TP 316L	S31603	min 175	min 485	min 35	Max. 90

## Standard Spec

### ▶ Product Specification

- Tube Specification
  - ASTM A213, A269, A312, JIS G3459
- TUBE MATERIAL
  - Austenite stainless steel, Copper / Copper alloy
- SHEATH MATERIAL
  - Flame-retardant PVC / TPU / PE / XLPE

- Tube length (Standard length)
  - Basic Length unit 4 ~ 6meter
  - Other pipe & tubes are also available upon request
- Coil length (Standard length)
  - About 550m per wooden reel
  - Longer length is available on special request

### ▶ Standard Tolerance

Grade	ASTM (UNS)	Standard	O.D Inch (mm)	W.T(%)
304 / 304L	S30400 / S30403	ASTM A269, ASTM A213	±0.005 [0.13]	±10%
316 / 316L	S31600 / S31603	ASTM A269, ASTM A213	±0.005 [0.13]	±10%

## Size & Length Detail

### ▶ Weight and length per coil

Imperial Size				Metric Size			
O.D(in)	W.T(in)	L(ft)	Weight(lb)	O.D(mm)	W.T(mm)	L(m)	Weight(kg)
1/4	0.035	2,693	220~260	6.35	0.90	821	100~120
	0.049	2,065			1.25	630	
3/8	0.035	1,702		9.53	0.90	519	
	0.049	1,273			1.25	388	
1/2	0.035	1,245		12.70	0.90	379	
	0.049	921			1.25	281	
3/4	0.049	593		19.05	1.25	181	
	0.065	456			1.65	139	
1	0.049	437		25.40	1.25	133	
	0.065	334			1.65	102	

### Product Items

# Seamless Straight Tube

### ▶ Size & Length Detail

PRODUCT	GRADE	AVAILABLE SIZE			REMARK
		DIAMETER	THICKNESS	LENGTH	
STRAIGHT TUBES	AUSTENITE (304, 304L, 316, 316L)	6 to 25.4mm (1/4" ~ 1")	0.8 to 2.11mm	4m, 6m	Coiled tubes Upon request

### ○ ASTM 213/269

Outside Diameter	Wall Thickness	Weight	Working pressure(bar) Temperature(°C)					Working Pressure (bar)
			20°C	100°C	200°C	300°C	400°C	
1/4	6.35	0.122	309	242	203	182	167	309
1/4	6.35	0.159	496	389	326	292	269	496
3/8	9.53	0.193	198	155	130	117	107	198
3/8	9.53	0.257	310	243	204	183	166	310
1/2	12.70	0.263	146	114	96	86	79	156
1/2	12.70	0.356	226	177	149	133	122	218
1/2	12.70	0.456	327	256	215	192	177	291
5/8	15.88	0.454	178	139	117	105	96	146
3/4	19.05	0.553	146	115	96	86	79	209
3/4	19.05	0.720	209	164	137	123	113	150
1	25.40	0.952	153	120	101	90	83	205
1	25.40	1.232	205	161	135	121	111	124

Product Items

# Special Alloys

Please consult us for other materials not listed.

Material	National Standard					
	Alloy	UNS CODE	ASTM	KS	JIS	DIN
Stainless Steel	304	S30400	304	STS 304	SUS 304	1.4301
	316	S31600	316	STS 316	SUS 316	1.4401
	316L	S31603	316L	STS 316L	SUS 316L	1.4404
	316L 2.5Mo	S31603	316L	STS316L	SUS316L	1.4435
	317L	S31703	317L	STS 317L	SUS 317L	1.4438
	321	S32100	321	STS 321	SUS 321	1.4541
	347	S24700	347	STS 347	SUS 347	1.4550
High Alloy Stainless Steel	904L	N08904	-	STS 890L	SUS 890L	1.4539
Super Austenitic	6 Mo	S31254	-	-	-	1.4547
Nickel Alloy	Monel 400	N04400	400	NCF 690 TB	NCF 690 TB	2.4360
	Nickel 200	N02200	200	NCF 600 TB	NCF 600 TB	2.4066
	Inconel 600	N06600	I600	NCF 800 TB	NCF 800 TB	2.4816
	Inconel 625	N06625	I625	NCF 625 TB	NCF 625 TB	2.4856
	Inconel 825	N08825	I825	NCF 825 TB	NCF 825 TB	2.4858
	Hastelloy C22	N06022	C22	NW6022	NW6022	2.4602
	Hastelloy C276	N10276	C276	NW0276	NW0276	2.4819
Duplex	Duplex	S31803, 32205,	-	STS329J3L	SUS329J3L	1.4462
Super Duplex	Super Duplex	S32750	-	-	-	1.4410
Copper	Copper	C12200	C12200	C12200	C12200	SF-Cu



Product Items

# Jacket Tube



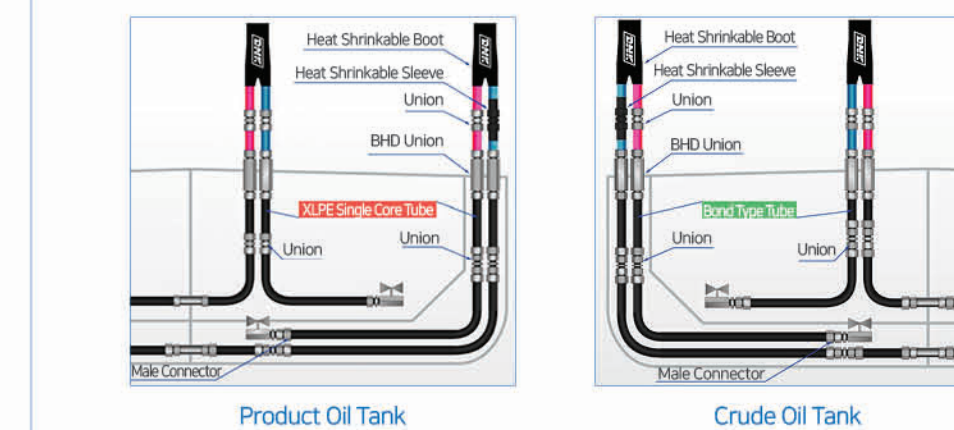
## ▶ XLPE-Sheathed Tube

Cross Sectional layer as 1 Core Tube with outer sheath by XLPE material. XLPE sheath is recommended for product oil (Cargo oil, Diesel oil, Gasoline, Jet Fuel oil, Naphtha, etc.) carriers where PVC sheath is not applicable. Shipyards conventionally installed bare tube without sheath in product oil tanks so the tube was bare exposed to corrosion. In order to prevent the possible tube corrosion in the tanks XLPE sheathed single core tube (non-adhesive) is highly recommended for product oil carriers. XLPE material properties are not available with adhesive.

## ▶ Bond Type Tube

The bond type tube is installed in water ballast tank (WBT) and crude oil tank (COT). This tube has a special adhesive layer between tube and protective outer sheath, capable of localizing any physical damage of the tube. When compared to conventional use of bare tube (typically 2mm wall) the bond type tube of 0.8-1.0mm wall is commonly adopted, which enables yard's installation easier and minimizes corrosion of tube in service.

## ▶ Typical Installation



## Sheath Material

### ▶ Properties of sheath

Material	PVC	TCR PVC	FR PVC	HFFR TPU	HFFR PE	XLPE
Tensile Strength(kgf/mm <sup>2</sup> )	1.2~1.4	2.0~2.4	1.3~1.6	2.3~2.8	1.0~1.3	2.0~2.3
Service Temperature (°C)	-40/+70	-50/+100	-40/+70	-50/+90	-45/+70	-50/+90
Elongation (%)	250~290	340~380	250~290	400~600	500~700	420~380
Hardness(Shore A or D)	84~90 (A)	81~85 (A)	86~90 (A)	87~380 (A)	93~95 (A)	90~95 (D)
Halogenated	0	0	0	X	X	X
Flame Retardant (IEC60332-1)	0	0	0	0	0	0
Flame Retardant (IEC60332-3-22 Category A)	X	0	0	0	0	0

Please consult us for other materials not listed.

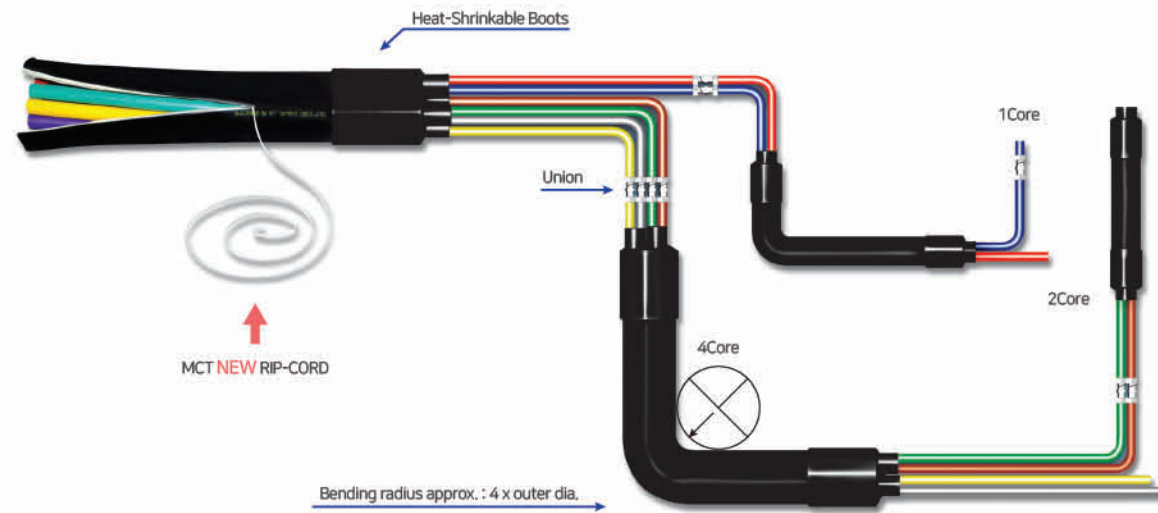
TCR : Thermal & Cold Resistance, FR : Flame Retardant, HFFR : Halogen Free & Flame Retardant, XLPE : Cross-Linked Polyethylene, TPU : Thermo Plastic Polyurethane

Product Items

# Multi Core Tube

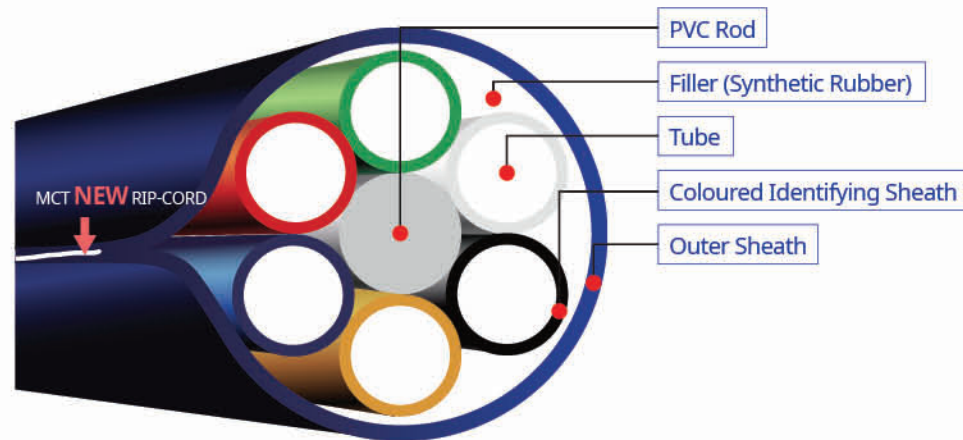


## Multi Core Tube Structure Schematism

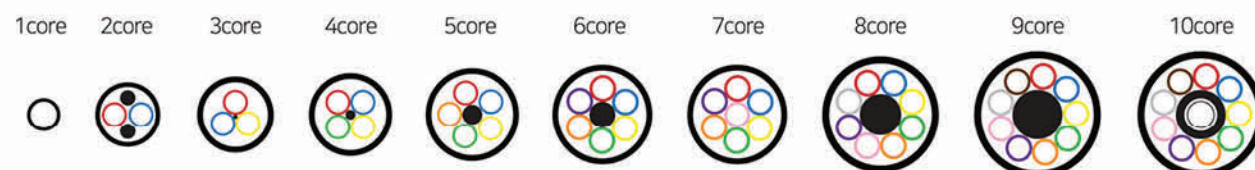


Dong Nam's Multi Core Tubes are spirally laid up and available with tubes in stainless steel, seamless and copper alloy. Straight bead welded, bright-annealed and calibrated high quality steel tubing. In order to easier identification and protection of tubes after installed, individual tubes are sheathed by PVC material of marked at every meter throughout the entire length for easy installation. Extruded outer sheath is oil resistance, weather proof, flame-retardant, corrosion and acid resistant and physical/chemical protection.

## Cross Section View



## Section Diagram

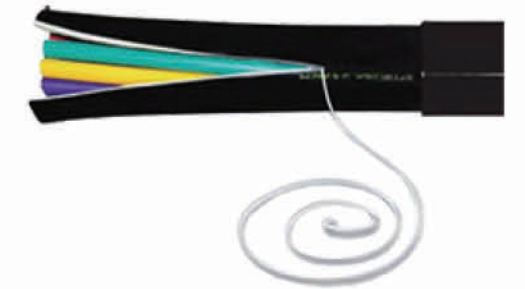


## Specification

Item	Description	Remark	
Tube	Core	1~10 tubes	
	Thickness	0.8 ~ 1.5mm	
	Length	About : 550m	Wooden reel
	Material	Austenite Stainless steel, Copper or Copper Alloy	
	Grade	ASTM A213, A269, JIS G3459	
Sheath	Material	Flame-Retardant / Halogen Free Material	Black
	Each tube	PVC	Various color

## Cross Section View

- H- Rip-cord is a high tensile string. You can Rip them up easily when you pull it out by a handy tool because it's inserted inside of multi core tube's filler continuously.
- It can prevent the safety accident by existing knife which is used for being Ripped outer sheath.
- It can save worker's load and time as it is much easier than the existing work.



## Use Advantage(Rip-Cord)



## Korean World-class Product Award 2014

Selected As The World Class Product of Korea  
- Minister of Trade, Industry & Energy Republic of Korea(December 8, 2014)



### ▶ Metric size

METRIC SIZE		WEIGHT(KG/M)						
		STAINLESS STEEL THICKNESS(mm)				COPPER THICKNESS(mm)		
O.D CORE	OVERALL DIAMETER (mm)	0.8	1	1.2	1.5	0.8	1	1.2
6 x 1	9	0.18	0.20	-	-	0.17	0.20	-
6 x 2	20	0.67	0.71	-	-	0.58	0.63	-
6 x 3	21	0.86	0.92	-	-	0.69	0.77	-
6 x 4	23	0.96	1.04	-	-	0.91	1.01	-
6 x 5	25	1.08	1.18	-	-	1.04	1.16	-
6 x 6	27	1.25	1.37	-	-	1.29	1.43	-
6 x 7	27	1.39	1.53	-	-	1.36	1.53	-
6 x 8	32	1.68	1.84	-	-	1.76	1.96	-
6 x 9	34	1.92	2.01	-	-	2.10	2.22	-
6 x 10	34	1.98	2.18	-	-	2.17	3.32	-
8 x 1	11	0.25	0.28	0.31	-	0.23	0.27	0.30
8 x 2	24	0.83	0.89	0.94	-	0.81	0.88	0.94
8 x 3	26	1.02	1.12	1.22	-	0.94	1.04	1.14
8 x 4	28	1.20	1.33	1.46	-	1.24	1.38	1.51
8 x 5	31	1.52	1.67	1.82	-	1.56	1.73	1.89
8 x 6	34	1.82	2.00	2.18	-	1.78	1.99	2.18
8 x 7	34	1.93	2.15	2.35	-	1.87	2.11	2.34
8 x 8	40	2.35	2.60	2.81	-	2.64	2.92	3.18
8 x 9	42	2.67	2.95	3.25	-	2.88	3.20	3.49
8 x 10	43	2.90	3.18	3.69	-	2.97	3.32	3.64
10 x 1	13	0.30	0.34	0.38	0.42	-	0.37	0.41
10 x 2	28	1.10	1.18	1.26	1.34	-	1.24	1.32
10 x 3	31	1.50	1.60	1.71	1.82	-	1.68	1.81
10 x 4	34	1.80	1.97	2.12	2.27	-	2.09	2.26
10 x 5	37	2.00	2.20	2.39	2.58	-	2.33	2.55
10 x 6	40	2.15	2.40	2.71	3.02	-	2.57	2.83
10 x 7	40	2.28	2.52	2.70	2.88	-	2.80	3.10
10 x 8	48	2.95	3.20	3.42	3.64	-	3.60	3.95
10 x 9	51	3.30	3.80	4.25	4.70	-	4.15	4.54
10 x 10	51	3.65	4.40	5.08	5.76	-	4.70	5.13
12 x 1	15	0.36	0.41	0.46	-	-	0.39	0.45
12 x 2	34	1.32	1.38	1.44	-	-	1.44	-
12 x 3	36	1.81	1.96	2.11	-	-	-	1.50
12 x 4	39	2.13	2.37	2.61	-	-	2.51	-
12 x 5	43	2.44	2.70	2.96	-	-	-	2.78
12 x 6	47	2.70	3.00	3.30	-	-	-	-
15 x 1	18	-	0.49	0.56	-	-	0.51	0.59

### ▶ Material

STANDARD	Stainless Steel			Copper		
	STS304	STS316	STS316L	C1201	C1220	C7060
JIS	SUS304	SUS316	SUS316L	C1201	C1220	C7060
ASTM	304	316	316L	C12000	C12200	C70600
DIN	1.4301	1.4401	1.4404	1787 SW-Cu	1787 SF-Cu	17664CuNi10Fe



### ▶ Imperial Size

IMPERIAL SIZE		WEIGHT(KG/M)					
		STAINLESS STEEL THICKNESS(mm)				COPPER THICKNESS(mm)	
O.D CORE	OVERALL DIAMETER (mm)	0.035"	1(mm)	0.049"	1.2(mm)	0.035"	0.049"
1/4" x 1	9	0.17	0.19	0.21	0.21	0.19	0.23
1/4" x 2	21	0.75	0.77	0.83	0.81	0.78	0.87
1/4" x 3	22	1.00	1.04	1.12	1.10	1.04	1.18
1/4" x 4	25	1.10	1.15	1.28	1.26	1.16	1.34
1/4" x 5	26	1.20	1.26	1.40	1.36	1.27	1.50
1/4" x 6	29	1.40	1.47	1.64	1.60	1.49	1.76
1/4" x 7	29	1.50	1.57	1.76	1.73	1.57	1.85
1/4" x 8	34	1.94	2.02	2.24	2.21	2.02	2.34
1/4" x 9	36	2.22	2.31	2.56	2.52	2.31	2.67
1/4" x 10	36	2.29	2.39	2.67	2.63	2.39	2.79
3/8" x 1	13	0.28	0.30	0.35	0.34	0.31	0.38
3/8" x 2	28	1.14	1.18	1.27	1.25	1.18	1.33
3/8" x 3	29	1.55	1.62	1.75	1.72	1.62	1.84
3/8" x 4	32	1.90	1.98	2.16	2.12	1.99	2.28
3/8" x 5	36	2.15	2.25	2.48	2.43	2.26	2.63
3/8" x 6	39	2.35	2.47	2.74	2.68	2.47	2.86
3/8" x 7	39	2.42	2.57	2.87	2.82	2.58	3.09
3/8" x 8	47	3.09	3.25	3.62	3.57	3.25	3.81
3/8" x 9	50	3.52	3.70	4.12	4.06	3.70	4.33
3/8" x 10	50	3.57	3.77	4.24	4.17	3.77	4.47
1/2" x 1	16	-	0.41	0.47	0.46	-	0.51
1/2" x 2	35	-	1.36	1.49	1.48	-	1.57
1/2" x 3	41	-	1.82	1.94	1.91	-	2.06
1/2" x 4	42	-	2.32	2.70	2.65	-	2.85
1/2" x 5	47	-	2.62	2.92	2.87	-	3.12
1/2" x 6	51	-	3.61	3.97	3.91	-	4.21

### ▶ Maximum Allowable Working Pressure

#### ○ Stainless Steel Seamless Tube

O.D (mm)	Wall Thickness (mm)				
	0.8	1.0	1.2	1.5	2.0
6	330	430	520	-	-
8	240	310	380	-	-
10	190	240	300	380	530
12	160	200	245	315	430
15	-	160	190	245	335

(Unit : bar)

O.D (mm)	Wall Thickness (mm)		
	0.035	0.049	0.065
1/4	350	515	720
3/8	225	330	450
1/2	165	240	325

(Unit : bar)

#### ○ Stainless Steel Welded Tube

O.D (mm)	Wall Thickness (mm)				
	0.8	1.0	1.2	1.5	2.0
6	260	340	420	-	-
8	195	245	305	-	-
10	155	195	235	305	425
12	125	160	195	252	344
15	-	125	155	195	270

(Unit : bar)

O.D (mm)	Wall Thickness (mm)		
	0.035	0.049	0.065
1/4	280	410	575
3/8	180	260	360
1/2	135	190	260

(Unit : bar)

#### ○ Copper Tube

O.D (mm)	Wall Thickness (mm)		
	0.8	1.0	1.2
6	105	140	175
8	75	100	125
10	60	80	100
12	160	200	245
15	-	125	155

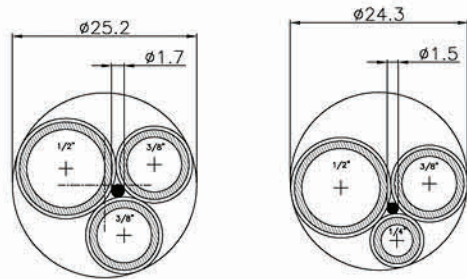
(Unit : bar)

O.D (in.)	Wall Thickness (mm)	
	0.035	0.049
1/4	110	175
3/8	70	110
1/2	50	80

(Unit : bar)

Product Items

# Multi OD Tube



This product is customized. We manufacture it based on buyer's instructed OD size.

Product Items

# Outer Sheath Material

## Properties of sheath

Material	PVC	TCR PVC	FR PVC	HFFR TPU	HFFR PE	XLPE
Tensile Strength(kgf/mm <sup>2</sup> )	1.2~1.4	2.0~2.4	1.3~1.6	2.3~2.8	1.0~1.3	2.0~2.3
Service Temperature (°C)	-40/+70	-50/+100	-40/+70	-50/+90	-45/+70	-50/+90
Elongation (%)	250~290	340~380	250~290	400~600	500~700	420~380
Hardness(Shore A or D)	84~90 (A)	81~85 (A)	86~90 (A)	87~380 (A)	93~95 (A)	90~95 (D)
Halogenated	0	0	0	X	X	X
Flame Retardant (IEC60332-1)	0	0	0	0	0	0
Flame Retardant (IEC60332-3-22 Category A)	X	0	0	0	0	0

Please consult us for other materials not listed.

TCR : Thermal & Cold Resistance, FR : Flame Retardant, HFFR : Halogen Free & Flame Retardant,

XLPE : Cross-Linked Polyethylene, TPU : Thermo Plastic Polyurethane

## Flame Retardant Test – Fire Insurers Laboratories of Korea

1) IEC60332-1 TEST

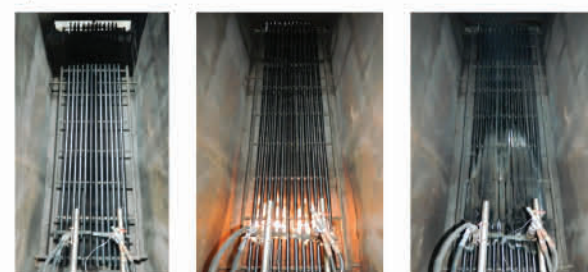


Before the test

During the test

After the test

2) IEC60332-3 TEST



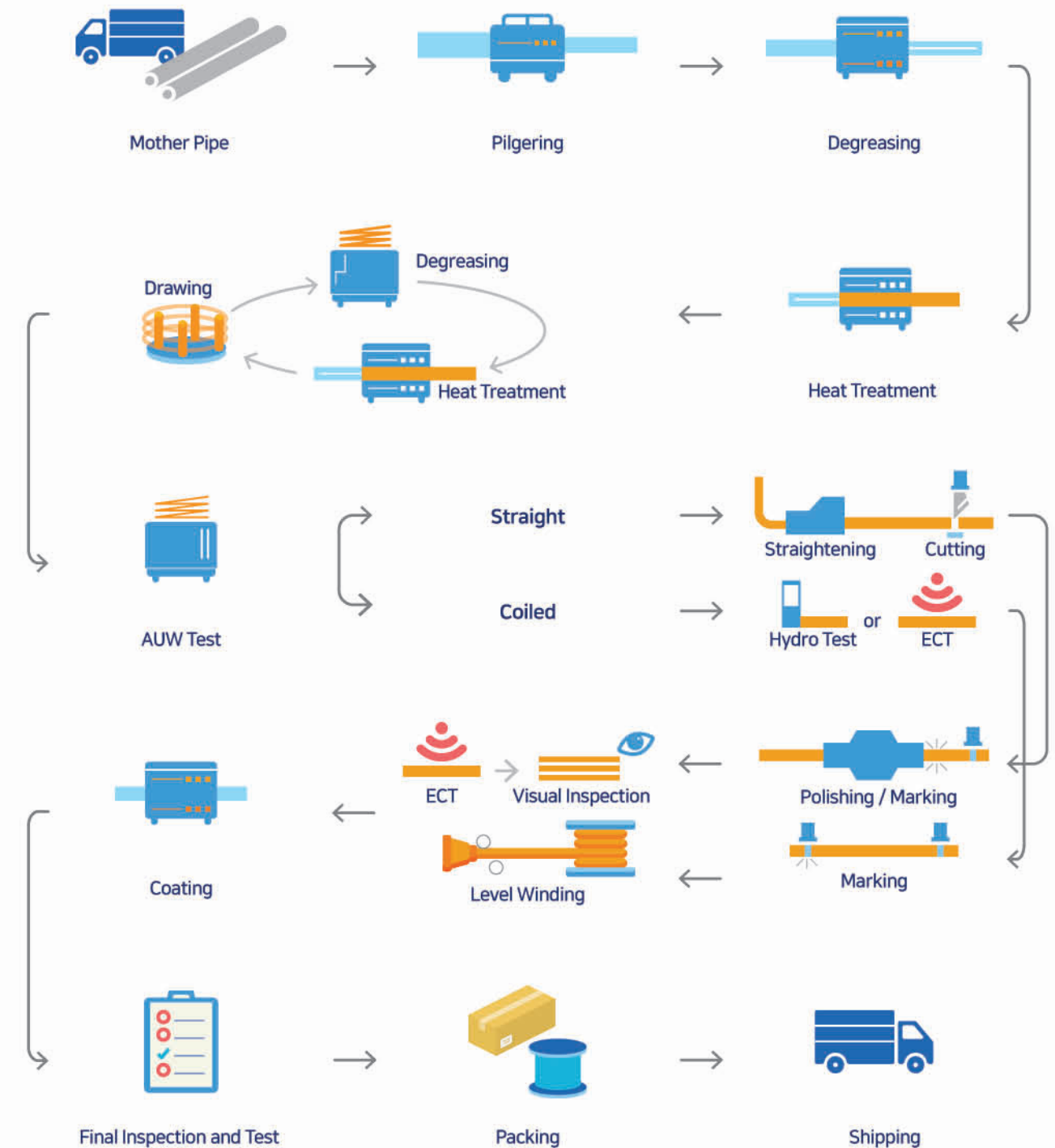
Before the test

During the test

After the test

Production

# Process





# Inspection & Testing

DongnamKorea QA system guarantees quality by monitoring the entire process according to the criteria and methods of ISO9001 certification system reflecting the specifications and standards of customers.

## ► Traceability throughout the entire manufacturing process:

- Material Test Reports accompany every shipment
- In-house, climate controlled laboratory
- Samples retained from every lot for peace of mind
- 100% Positive Material Identification (PMI)
- 100% Pressure Testing of all coils



Universal testing machine



Micro vickers hardness tester



Microscope



Surface roughness meter



PMI machine



Eddy current test machine



Ultrasonic test machine

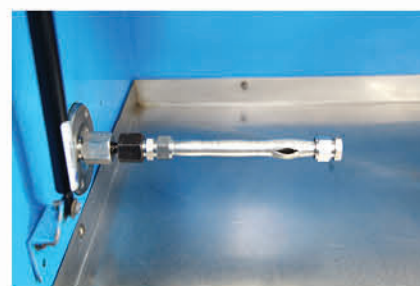
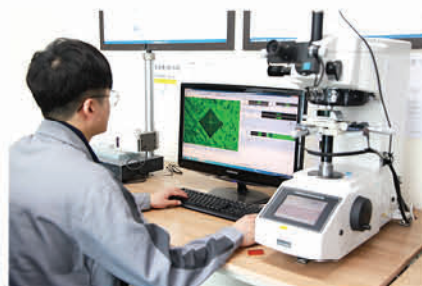


Pressure test machine



Burst test machine

Dongnam Korea secures and operates laboratories, test equipment, and test personnel necessary to meet customer demand quality.

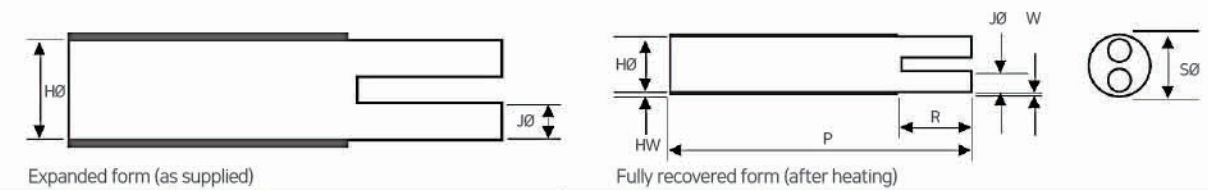


## Accessories

# HEAT SHRINKABLE BOOTS

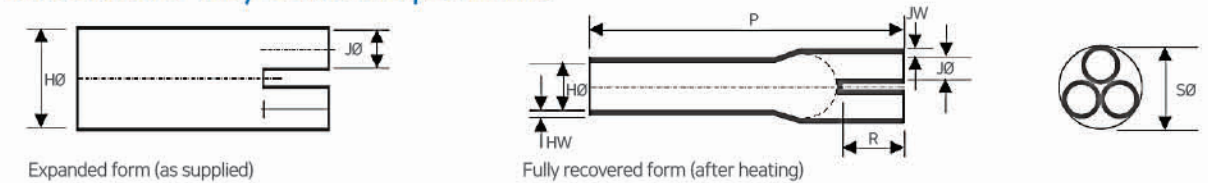
Heat shrinkable boots provides complete water sealing, and abrasion and corrosion protection under the most adverse environmental conditions.

## ► 200 Series 2-Way Outlet Shapes in line



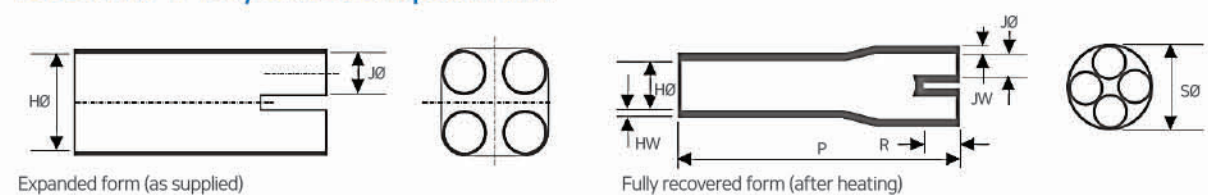
Conductor size mm <sup>2</sup>	HT Part NO.	Expanded(Min)				Recovered(Max)		Recovered dimensions fully shrunk				
		H	H-H Matl	J	J-H Matl	H	J	P±10%	R±10%	S(nom)	HW±20%	W±20%
4-35	*223-2	30.0	30.0	15.0	15.0	9.4	4.1	94.0	30.0	20.0	1.5	1.2
35-150	*218-1	50.0	50.0	21.0	21.0	22.9	7.6	119.0	34.0	30.0	3.2	3.2

## ► 300 Series 3-Way Outlet Shapes in line



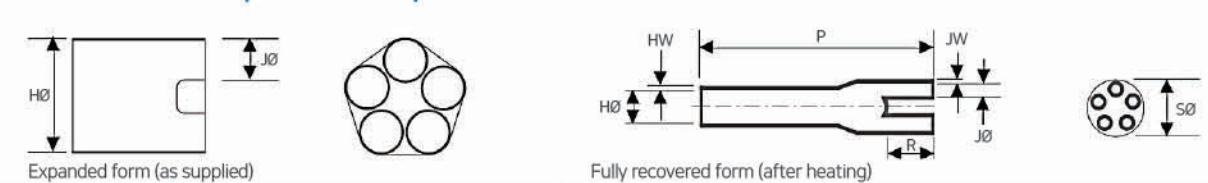
Conductor size mm <sup>2</sup>	HT Part NO.	Expanded(Min)		Recovered(Max)		Recovered dimensions fully shrunk				
		H	J	H	J	S(nom)	P±10%	R±10%	HW±20%	W±20%
16-35	*319-1	31.0	15.0	17.5	4.6	23.0	93.5	28.5	2.9	2.9
50-150	*328-1	43.2	20.8	22.9	7.6	36.0	99.0	34.0	3.8	3.8

## ► 400 Series 4-Way Outlet Shapes in line



Conductor size mm <sup>2</sup>	HT Part NO.	Expanded(Min)		Recovered(Max)		Recovered dimensions fully shrunk				
		H	J	H	J	S(nom)	P±10%	R±10%	HW±20%	W±20%
16-35	*319-1	31.0	15.0	17.5	4.6	23.0	93.5	28.5	2.9	2.9
50-150	*328-1	43.2	20.8	22.9	7.6	36.0	99.0	34.0	3.8	3.8

## ► 500 Series 5-Way Outlet Shapes in line



Conductor size mm <sup>2</sup>	Expanded(Min)				Recovered(Max)		Recovered dimensions fully shrunk				
	H	H-H Matl	J	J-H Matl	H	J	S(nom)	P±10%	R±10%	HW±20%	JW±20%
508-1	60.0	60.0	30.0	22.5	24.5	7.5	48.0	180.0	30.0	3.5	3.0

\* 6core Boots can be provided.

## Accessories

# Tube Fittings

DNK supplies accessories for tubes such as heat shrinkable boots, tube joint fittings, tube cutter bending tool and etc.

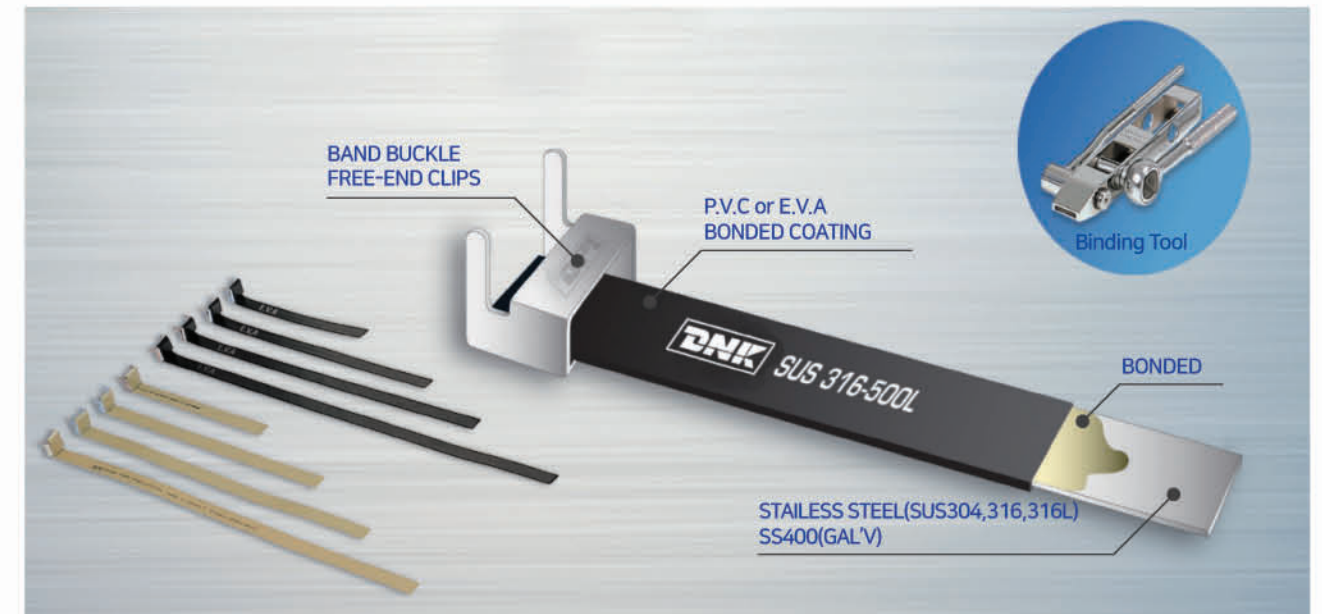


Multi core tube can be connected by welding, soldering or fitting, We encourage bite type tube fitting for high pressure use.



## Accessories

# Cable Binding Tape (Band Hoop & Buckle)



## ▶ GALVANIZED STEEL

## ▶ STAINLESS STEEL (SUS304,SUS316,SUS316L)

No.	Length (mm)	Type	Thickness (mm)	Width (mm)	Color	No.	Length (mm)	Type	Thickness (mm)	Width (mm)	Color
BH(GN)-1	300	No Coating	0.4	15	-	BH(SN)-1	300	No Coating	0.4	15	-
BH(GN)-2	400					BH(SN)-2	400				
BH(GN)-3	500					BH(SN)-3	500				
BH(GN)-4	600					BH(SN)-4	600				
BH(GN)-5	700					BH(SN)-5	700				
BH(GC)-1	300	P.V.C or E.V.A Bonded Coating	0.4	15	White	BH(SC)-1	300	P.V.C or E.V.A Bonded Coating	0.4	15	White
BH(GC)-2	400				Gray	BH(SC)-2	400				Gray
BH(GC)-3	500				Ivory	BH(SC)-3	500				Ivory
BH(GC)-4	600				Black	BH(SC)-4	600				Black
BH(GC)-5	700				Green	BH(SC)-5	700				Green

