

IPL

PRE-INSULATED SYSTEMS

IPL - PRE
INSULATED
PIPES FITTINGS
VALVES





INDEX

INTRODUCTION	03
PRE-INSULATED PIPES	04
APPLICATIONS	05
TECHNICAL SPECIFICATION AND STANDARDS OF CARRIER PIPE	06
INSULATION	08
HDPE OUTER JACKET	09
LEAK DETECTION AND LOCATION SYSTEM	10
PRODUCT RANGE	11
INSTALLATION	23
STORAGE, HANDLING & TRANSPORTATION	26
TRANSPORTATION	27
STORAGE	28
QUALITY ASSURANCE SYSTEM	29
CERTIFICATES	30

INTRODUCTION

IPL has been manufacturing pre insulated pipes, fittings and valves since 2005. The many years of experience and an ongoing modernization of the Company have resulted in creation of high quality pre insulated pipe systems for supplying district cooling and many other industrial sectors.

Pre insulated pipes are designed for construction of district cooling networks installed directly in the ground and used for distributing chilled water under the pressure up to 20 bars at temperature 4 to 12°C. Pre insulated components with HDPE jacket are designed for construction of underground networks.

Pre insulated pipes, fittings and accessories are manufactured in accordance with following standards: PN-EN 253 and PN-EN 488. Coupling insulation complies with requirements of PN-EN 489 standard.

IPL Pre insulated pipes and fittings may also be manufactured with carrier pipes made of stainless steel, HDPE and GRP.

For more detail information about the above mentioned products please contact our Customer Service or Process Engineering. The company activities include organization of periodic training in scope of designing and assembly of IPL pre insulated pipe systems. In field of designing we offer technical advisory, design documentation assessment and adaptation of other technology designs to IPL system.

Our technical services include installation of welded joint insulation.



PRE-INSULATED PIPES

Pre insulated mainly consists of following three components.

- Carrier pipe or Service pipe
- Polyurethane foam.
- Jacket pipe or Outer Casing pipe.

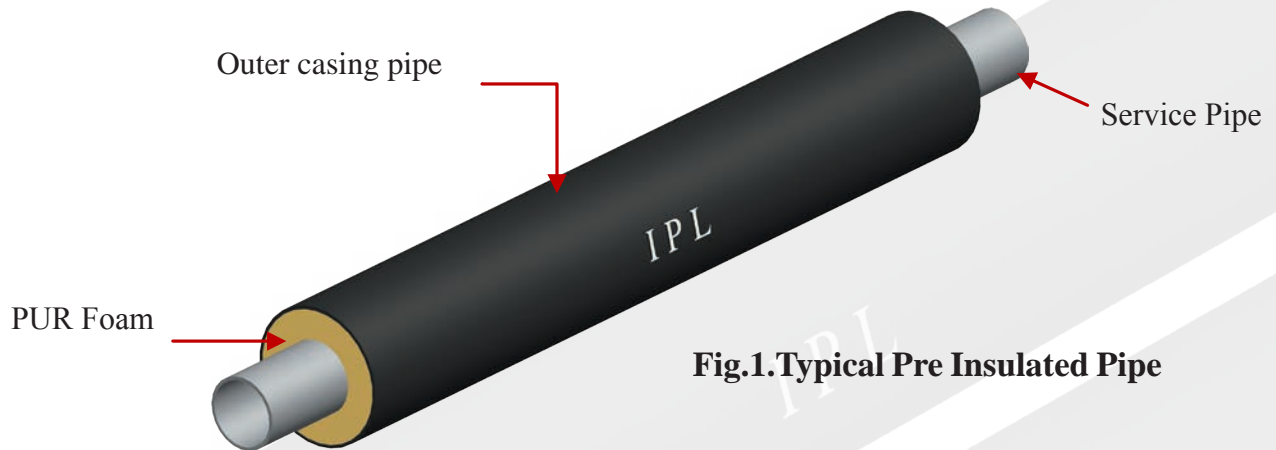


Fig.1. Typical Pre Insulated Pipe

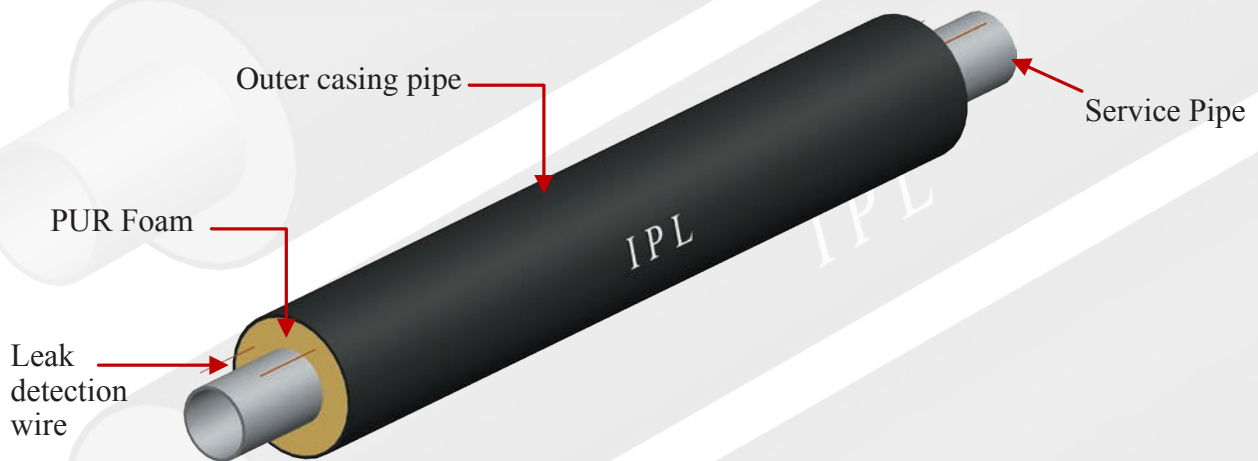
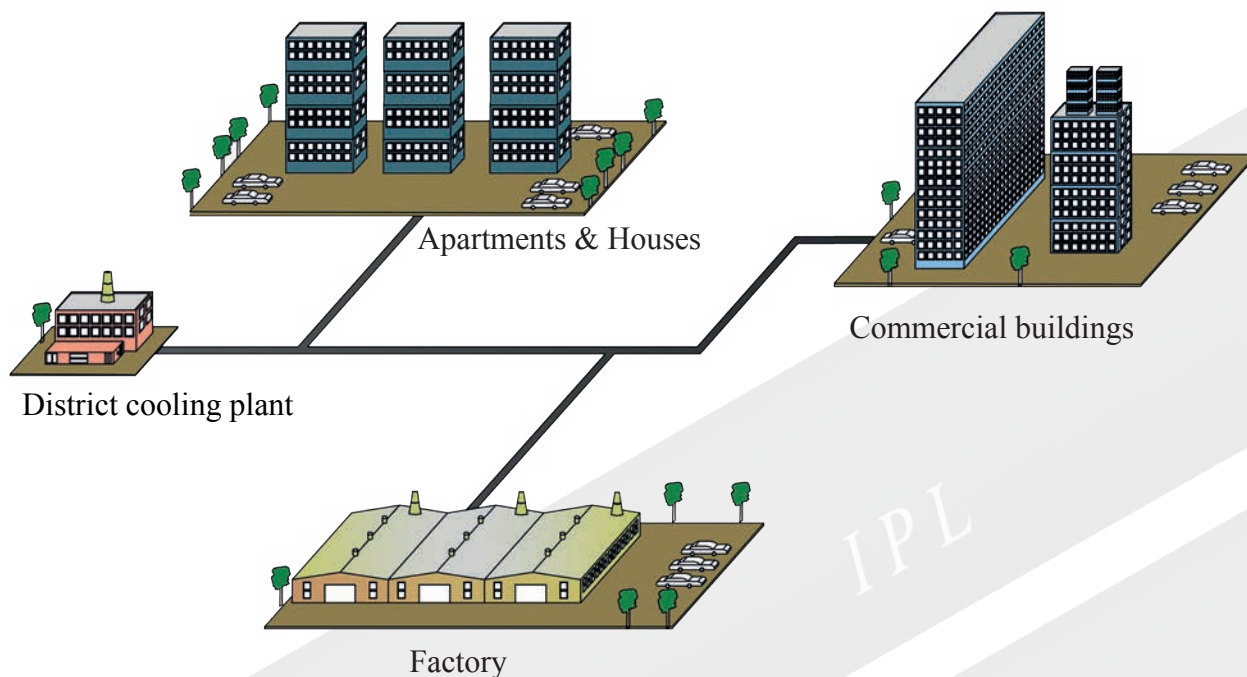


Fig.2. Typical Pre Insulated Pipe with Leak Detection Wires

IPL produced the following pre-insulated pipes.

- Pre insulated steel carrier (ERW&seamless) pipe with HDPE/GRP/GI spiral casing pipe.
- Pre insulated GRP carrier pipe with HDPE/GRP casing.
- Pre insulated HDPE carrier pipe with HDPE casing.
- Pre insulated ABS carrier pipe with HDPE casing.
- Pre insulated pipe with leak sensor cable for leak detection system.
- Pre insulated pipe fitting (factory pre insulated)
- Pre insulated pipe fitting fabrication as per site requirement
- Pre insulated flange and welded valves.

APPLICATIONS



IPL pre-insulated pipes provides safe, cost effective energy conscious and fuel efficient solutions in a wide range of industrial, commercial and domestic applications:

- District cooling
- Underground cooling and HWS mains
- Corrosive chemical pipes
- Aboveground cooling and HWS mains
- Geo-thermal water pipes
- Process fluid pipes
- Secondary refrigerant pipes
- Temperature sensitive product lines
- Chilled water mains

The IPL pre-insulated pipe range comprises an extensive range of standard pre-insulated pipes and fittings in various service pipe materials. In addition, components and assemblies can be prefabricated and pre-insulated as required.

BENEFITS & FEATURES

- A high integrity and durable finished product
- Excellent thermal characteristics
- Comprehensive range of pipes, fittings and equipment
- Range of service pipe material options
- Quick and easy to install maximizing on-site efficiency
- Permanently sealed against ingress of external fluids
- Can be prefabricated to specific site requirements
- Ideal for below and above ground use

TECHNICAL SPECIFICATION AND STANDARDS OF CARRIER PIPE

IPL produced the pre-insulated pipe by using the carrier pipe which is listed in below

- Welded steel pipe well-known as ERW pipes
- Seamless pipes
- Spiral welded pipes SSAW
- Longitude welded pipes LSAW
- HDPE (PE100) SDR 11 and SDR 17

Diameter Scope DN 20 to 1200 mm

- ASTM A53 - American standard for ERW pipes
- ASTM A106 - American standard for seamless pipes
- API 5L - American standard for SSAW or LSAW pipes
- EN 10220 - European standard for all steel pipes
- ISO 4427 - German standard for HDPE pipes

Carrier Pipes -ASTM A53/A106/API 5L Type ERW, SEAMLESS, SSAW, and LSAW

Nominal pipe size inches	OD mm	30	STD	40	XS	Nominal pipe size inches	OD mm	30	STD	40	XS
3/4	26.70	-	2.87 1.69	2.87 1.69	3.91 2.20	18	457.00	11.13 122.38	9.53 105.16	14.27 155.80	12.70 139.15
1	33.40	-	3.38 2.50	3.38 2.50	4.55 3.24	20	508.00	12.70 155.12	9.53 117.15	15.09 183.42	12.70 155.12
1 1/4	42.20	-	3.56 3.39	3.56 3.39	4.85 4.47	22	559.00	12.70 171.09	9.53 129.13	-	12.70 171.09
1 1/2	48.30	-	3.68 4.05	3.66 4.05	5.08 5.41	24	610.00	14.27 209.64	9.53 141.12	17.48 255.41	12.70 187.06
2	60.30	-	3.91 5.44	3.91 5.44	5.54 7.48	26	660.00	-	9.53 152.87	-	12.70 202.72
2 1/2	73.00	-	5.16 8.63	5.16 8.63	7.01 11.41	28	711.00	15.88 271.21	9.53 164.85	-	12.70 218.69
3	88.90	-	5.49 11.29	5.49 11.29	7.62 15.27	30	762.00	15.88 292.18	9.53 176.84	-	12.70 234.67
3 1/2	101.60	-	5.74 13.57	5.74 13.57	8.08 18.63	32	813.00	15.88 312.15	9.53 188.82	17.48 342.91	12.70 250.64
4	114.30	-	6.02 16.07	6.02 16.07	8.56 22.32	34	864.00	15.88 332.12	9.53 200.31	17.48 364.90	12.70 266.61
5	141.30	-	6.55 21.77	6.55 21.77	9.53 30.97	36	914.00	15.88 351.70	9.53 212.56	19.05 420.42	12.70 282.27
6	168.30	-	7.11 28.26	7.11 28.26	10.97 42.56	38	965.00	-	9.53 224.00	-	12.70 298.24
8	219.10	7.04 36.81	8.18 42.55	8.18 42.55	12.70 64.64	40	1016.00	-	9.53 236.53	-	12.70 314.22
10	273.10	7.80 51.03	9.27 60.31	9.27 60.31	12.70 81.55	42	1067.00	-	9.53 248.52	-	12.70 330.19
12	323.90	8.38 65.20	9.53 73.88	10.31 79.73	12.70 97.46	44	1118.00	-	9.53 260.50	-	12.70 346.16
14	355.60	9.53 81.33	9.53 81.33	11.13 94.55	12.70 107.39	46	1168.00	-	9.53 272.25	-	12.70 351.82
16	406.40	9.53 93.27	9.53 93.27	12.70 123.30	12.70 123.30	48	1219.00	-	9.53 284.24	-	12.70 377.79

PE 100 Pipes Wall Thickness and Mass Table According to ISO 4427

Nominal Diameter (DN) mm	SDR 17 PN10		SDR 11 PN16	
	Thickness (S) mm	Mass kg/m	Thickness (S) mm	Mass kg/m
50	3.0	0.45	4.6	0.66
63	3.8	0.71	5.8	1.04
75	4.5	1.01	6.8	1.46
90	5.4	1.45	8.2	2.11
110	6.6	2.15	10.0	3.13
125	7.4	2.74	11.4	4.06
140	8.3	3.44	12.7	5.06
160	9.5	4.50	14.6	6.64
180	10.7	5.69	16.4	8.40
200	11.9	7.02	18.2	10.36
225	13.4	8.90	20.3	13.00
250	14.8	10.91	22.7	16.12
280	16.6	13.70	25.4	20.21
315	18.7	17.35	28.6	25.58
355	21.1	22.09	32.2	32.47
400	23.7	27.91	36.3	41.23
450	26.7	35.36	40.9	52.21
500	29.7	43.70	45.4	64.42
560	33.2	54.74	50.8	80.70
630	37.4	69.33	57.2	102.25

INSULATION

Thermal insulation is made of polyurethane foam which has excellent mechanical and thermal properties exceeding requirements specified in PN-EN 253 standard. Tested technology and application of state-of-the-art polyurethane system ensures uniform distribution and filling of the inter-pipe space on entire length of pre insulated pipes.

Mechanical and thermal properties of polyurethane foam:

Density	$\geq 60 \text{ kg/m}^3$
Closed cells	$\geq 88\%$
Water absorption	$\leq 10\%$
Compression strength	$\geq 0,30\text{MPa}$
Axial shear strength	$\geq 0,12\text{MPa}$
Static shear strength	$\geq 0,2\text{MPa}$
Thermal conductivity	0.023 to 0.029 W/mK.
Maximum temperature at continuous operation for 30 years	160°C

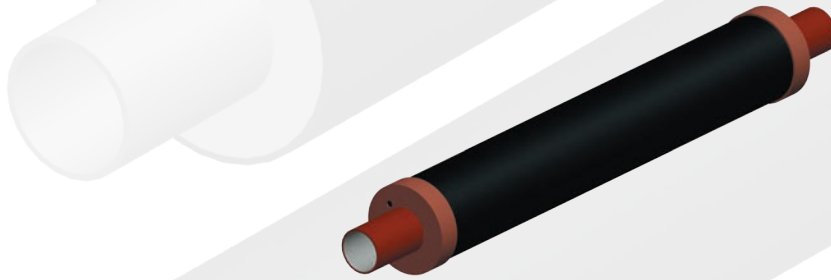
Due to ongoing development in field of polyurethane systems we reserve the right to change polyurethane foam parameters.

TYPES OF INSULATION METHOD

IPL manufacturing the pre insulated pipe by using the following two types of insulation method.

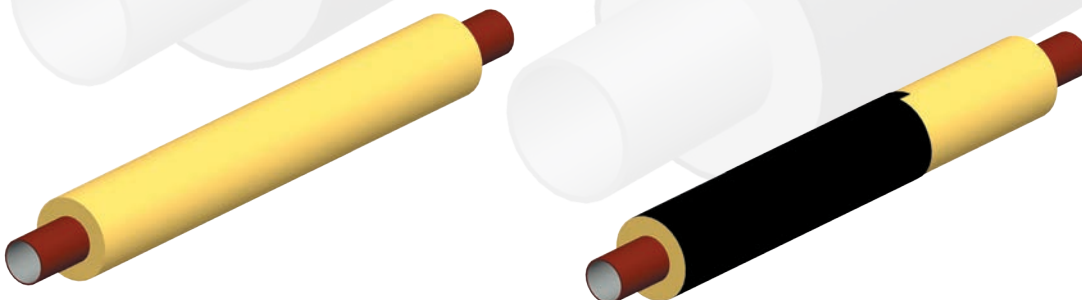
1. High Pressure foam injection method

High pressure foam is injected in to the gap between the carrier and outer casing pipe.



2. Foam spraying method

Foam is sprayed directly to the carrier pipe until required thickness achieved then HDPE casing extruded directly on the foam.



HDPE OUTER JACKET

Outer jacket is made of high density polyethylene (HDPE) and complies with requirements specified in PN-EN 253 standard.

Physical and mechanical properties:

Density	$\geq 950 \text{ kg/m}^3$
Yield point	$> 19 \text{ MPa}$
Melt flow index	$> 0,38-0,8 \text{ g/10mm}$
Ultimate elongation	$> 350\%$
Thermal conductivity λ_{PE}	$0,43 \text{ W/mK}$

To achieve better adhesion of foam to HDPE pipe, the inner surfaces of pipes have been subjected to decortication process.

METAL OUTER JACKET

Pre insulated pipes used in over ground network construction are supplied with metal outer jacket in form of spiral pipe made of wound galvanized steel or aluminium band. Pre insulated pipes may be furnished with another type of outer jacket upon specific order.

TECHNICAL SPECIFICATION SYSTEM ELEMENTS

Straight pipes

Straight pipes are manufactured with 6 to 12 meter long insulated steel ends, beveled in accordance with ISO 6761. Other lengths of uninsulated ends available upon request

Bent pipes

Pre insulated bent pipes are mechanically bent steel pipes with pre insulation.

Pipe bends

Pre insulated pipe bends are manufactured in accordance with PN-EN 448 standard.

Diameter DN 20-100 pipe bends are made of cold bent steel pipe, bending radius $R=3d$, bending angle 5-90°.

Diameter DN 125-1000 pipe bends are made of butt welded straight section pipes, bending radius $R=1.5d$, bending angle 5-90°. Welded pipe bends to be welded are made of cold bent steel pipe, with so called Hamburg bending method or by hot forming of steel plate, connected by means of welding.

Upon request, pipe bends with diameter from DN 100 to 500 may be manufactured as cold bent bends with 3d radius or welded bends with 2.5d radius.

Tees

Pre insulated pipe tees are manufactured in accordance with PN-EN 448 and PN-EN 13941 standard.

Upon request, manufactured pipe tees may be reinforced with reinforcing plates or with greater wall thickness for carrier pipe or branch pipe.

Pipe tees which enable assembly of branch pipe without cutting the main pipe – i.e. “cold cut” to pipeline without medium or “hot cut” with special cut-off valve for pressurized pipeline are available upon request. Works carried out by IPL technical service.

Anchors

Pre insulated anchors are manufactured with a support plate fixed between reinforcing ribs which are welded on to carrier pipe. Fixed points allow force transmission at 150MPa axial stress.

*Angular anchors are available upon request.

Fittings

Cut-off ball valves used in preinsulation comply with requirements specified in PN-EN 488 standard. Working parameters of valves, pressure 20 bars and maximum axial stress in pipeline 300 MPa, Preinsulated ball valves are manufactured with DN 20 to 600 diameters. Tee wrenches, portable planetary gears or stationary gears are used for operating the valves. Ball valves with stainless steel casing are used for drains and breathers.

Customized fittings

Upon request and after an agreement with the Customer, IPL can provide customized fittings which are not included in the product catalogue, for example: pipe bends with longer arms, tees with non-standard diameter configurations or offsets for modification of vertical direction.

LEAK DETECTION AND LOCATION SYSTEM



IPL leak detection/location is an automatic leak detection/location system. Working on our IPL Pulse Echometry, or TDR (Time Domain Reflectometry), principle, it can be described as radar. It creates a longitude “map” of the pipeline network, sending defined pulses on the detector wire or cable. Any break, leak or other type of fault, is immediately detected by the alarm unit, stored in a battery-backed memory, and automatically displayed in clear wording. If the unit is connected to a main computer, all information will be transmitted to and stored there. The communication can be carried over telephone lines, a separate communication cable or via radio link, GSM or satellite. The information can be inspected on a LCD display showing the distance to the fault in meters or feet, time and type of fault.

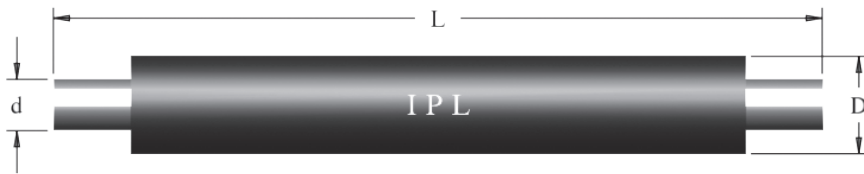
The IPL has a variety of units and factory installed options together with a wide range of accessories. The units can be configured in different ways depending on the application, type of liquid, environment, power supply or way to communicate. There is a wide selection of detectors and cables available depending on application and climate conditions.

Specially designed cables can be manufactured upon request. Each unit is capable of monitoring up to 4,000 m of pipe, and the system can be expanded to 250 units giving a total capacity of 1,000 kilometers.

PRODUCT RANGE

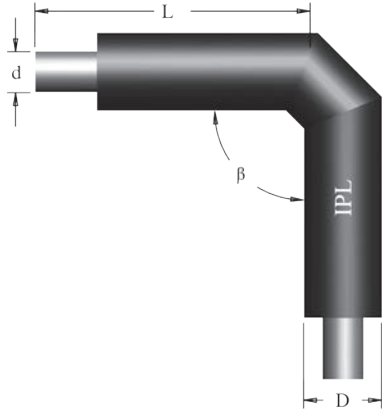
1. SINGLE PREINSULATED PIPES WITH HDPE JACKET

1.1. STRAIGHT PIPE - STANDARD INSULATION



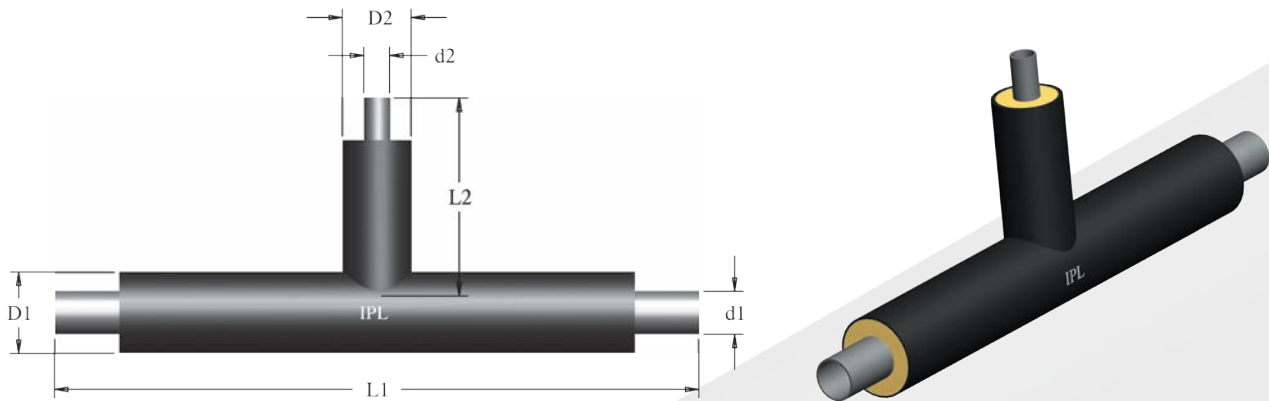
Carrier pipe		Jacket		Weight		Standard length	
dn	d	Welded steel pipes	Seamless steel pipes	D	Welded steel pipes	Seamless steel pipes	L
		S_{min}^{***}	S_{min}^{***}		M		
[mm]	[mm]	[mm]	[mm]	[mm]	[kg/m]		[m]
20	26,9	2,6	2,6	90	2,7	2,7	6/12
25	33,7	2,6	2,6	90	3,1	3,1	6/12
32	42,4	2,6	2,6	110	4,0	4,0	6/12
40	48,3	2,6	2,6	110	4,4	4,4	6/12
50	60,3	2,9	2,9	125	5,8	5,8	6/12
65	76,1	2,9	2,9	140	7,5	7,5	6/12
80	88,9	3,2	3,2	160	9,5	9,5	6/12
100	114,3	3,6	3,6	200	13,6	13,6	12
125	139,7	3,6	4,0	225	16,8	18,1	12
150	168,3	4,0	4,5	250	20,6	22,6	12
200	219,1	4,5	6,3	315	31,8	41,1	12
250	273,0	5,0	6,3	400	46,0	54,4	12
300	323,9	5,6	7,1	450	59,0	70,5	12
350	355,6	5,6	8,0	500	67,0	87,3	12
400	406,4	6,3	8,8	560*	85,0	109,1	12
450	457,0	6,3	10,0	630	99,0	139,0	12
500	508,0	6,3	11,0	710**	109,0	166,1	12
600	610,0	7,1		800	150,0		12
700	711,0	8,0		900	190,0		12
800	813,0	8,8		1000	240,0		12
900	914,0	10,0		1100	300,0		12
1000	1016,0	11,0		1200	360,0		12

1.2. ELBOW FROM 5° TO 90°



Carrier pipe tube		Jacket	Radius	Stand arm length	
dn	d	Smin	D	R	L
[mm]	[mm]	[mm]	[mm]	-	[m]
20	26,9	2,6	90	3d	1,00
25	33,7	2,6	90	3d	1,00
32	42,4	2,6	110	3d	1,00
40	48,3	2,6	110	3d	1,00
50	60,3	2,9	125	3d	1,00
65	76,1	2,9	140	3d	1,00
80	88,9	3,2	160	3d	1,00
100	114,3	3,6	200	3d	1,00
125	139,7	3,6	225	1,5d	1,00
150	168,3	4,0	250	1,5d	1,00
200	219,1	4,5	315	1,5d	1,00
250	273,0	5,0	400	1,5d	1,00
300	323,9	5,6	450	1,5d	1,00
350	355,6	5,6	500	1,5d	1,00
400	406,4	6,3	560	1,5d	1,00
450	457,0	6,3	630	1,5d	1,10
500	508,0	6,3	710	1,5d	1,20
600	610,0	7,1	800	1,5d	1,30
700	711,0	8,0	900	1,5d	1,50
800	813,0	8,8	1000	1,5d	1,60
900	914,0	10,0	1100	1,5d	1,80
1000	1016,0	11,0	1200	1,5d	2,00

1.3. STRAIGHT TEE



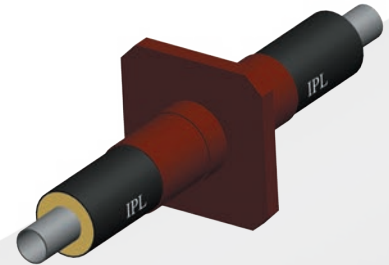
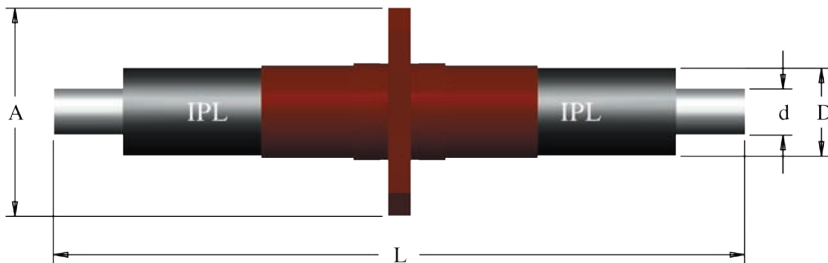
Main pipe			Branch pipe		
Diameter		Length	Diameter		Length
d1	D1	L1	d2	D2	L2
[mm]	[mm]	[m]	[mm]	[mm]	[m]
26,9	90	1,00	26,9	90	1,00
33,7	90	1,00	26,9 - 33,7	90	1,00
42,4	110	1,00	26,9 - 33,7	90	1,00
48,3	110	1,00	26,9 - 42,4	90 - 110	1,00
60,3	125	1,00	26,9 - 48,3	90 - 110	1,00
76,1	140	1,00	26,9 - 60,3	90 - 125	1,00
88,9	160	1,00	26,9 - 76,1	90 - 140	1,00
114,3	200	1,00	26,9 - 88,9	90 - 160	1,00
139,7	225	1,00	26,9 - 114,3	90 - 200	1,00
168,3	250	1,00	26,9 - 168,3	90 - 250	1,00
219,1	315	1,50	26,9 - 168,3	90 - 250	1,00
273,0	400	1,50	26,9 - 168,3	90 - 250	1,00
323,9	450	1,50	26,9 - 168,3	90 - 250	1,00
355,6	500	1,50	26,9 - 219,1	90 - 315	1,00
406,4	560	1,50	26,9 - 219,1	90 - 315	1,00

1.4. REDUCER



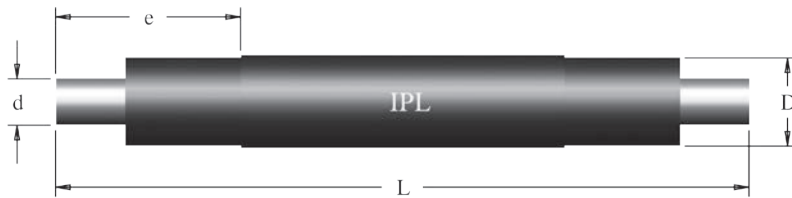
Carrier pipe		Minimum reduction diameter		Length	
dn	d1	D1	d2	D2	L
[mm]	[mm]	[mm]	[mm]	[mm]	[m]
20	26,9	90	-	-	-
25	33,7	90	26,9	90	1,00
32	42,4	110	26,9	90	1,00
40	48,3	110	26,9	90	1,00
50	60,3	125	33,7	90	1,00
65	76,1	140	42,4	110	1,00
80	88,9	160	48,3	110	1,00
100	114,3	200	60,3	125	1,00
125	139,7	225	76,1	140	1,00
150	168,3	250	88,9	160	1,00
200	219,1	315	114,3	200	1,00
250	273,0	400	139,7	225	1,50
300	323,9	450	168,3	250	1,50
350	355,6	500	219,1	315	1,50
400	406,4	560	273,0	400	1,50
450	457,0	630	323,9	450	1,50
500	508,0	710	355,6	500	1,50
600	610,0	800	406,4	560	1,50

1.5. PUDDLE FLANGE



Carrier pipe			Jacket	Dimension	Length
dn	d	S _{min}	D	A	L
[mm]	[mm]	[mm]	[mm]	[mm]	[M]
20	26,7	2,6	90	140	2,00
25	33,7	2,6	90	140	2,00
32	42,4	2,6	110	160	2,00
40	48,3	2,6	110	160	2,00
50	60,3	2,9	125	180	2,00
65	76,1	2,9	140	190	2,00
80	88,9	3,2	160	240	2,00
100	114,3	3,6	200	280	2,00
125	139,7	3,6	225	305	2,00
150	168,3	4,0	250	330	2,00
200	219,1	4,5	315	395	2,00
250	273,0	5,0	400	480	2,00
300	323,9	5,6	450	530	2,00
350	355,6	5,6	500	580	3,00
400	406,4	6,3	560	640	3,00
450	457,0	6,3	630	710	3,00
500	508,0	6,3	710	790	3,00
600	610,0	7,1	800	890	3,00

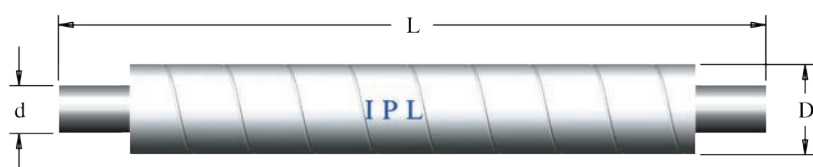
1.6 – STRAIGHT JOINT



End Diameter		Compensation		Length	
dn	d	D	e standard	e max	L
[mm]	[mm]	[mm]	[mm]	[mm]	[m]
32	42,4	110	100	100	2,00
40	48,3	110	100	100	2,00
50	60,3	125	100	100	2,00
65	76,1	140	100	125	2,00
80	88,9	160	100	125	2,00
100	114,3	200	125	125	2,00
125	139,7	225	125	125	2,00
150	168,3	250	125	150	2,50
200	219,1	315	125	150	2,50
250	273,0	400	125	175	2,50
300	323,9	450	125	175	2,50
350	355,6	500	125	175	3,00
400	406,4	560	125	175	3,00
450	457,0	630	125	200	3,00
500	508,0	710	125	200	3,00
600	610,0	800	125	200	3,00

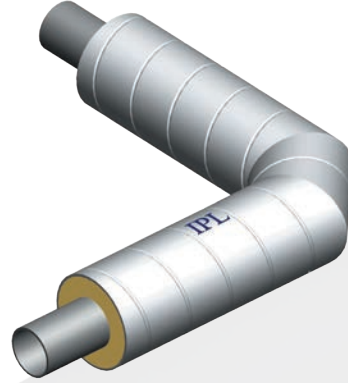
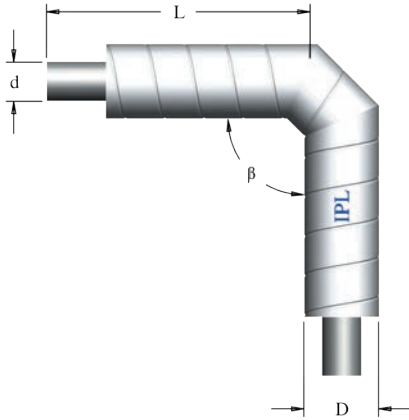
2. SINGLE PREINSULATED PIPES WITH METAL JACKET

2.1-STRAIGHT PIPE STANDARD PLUS



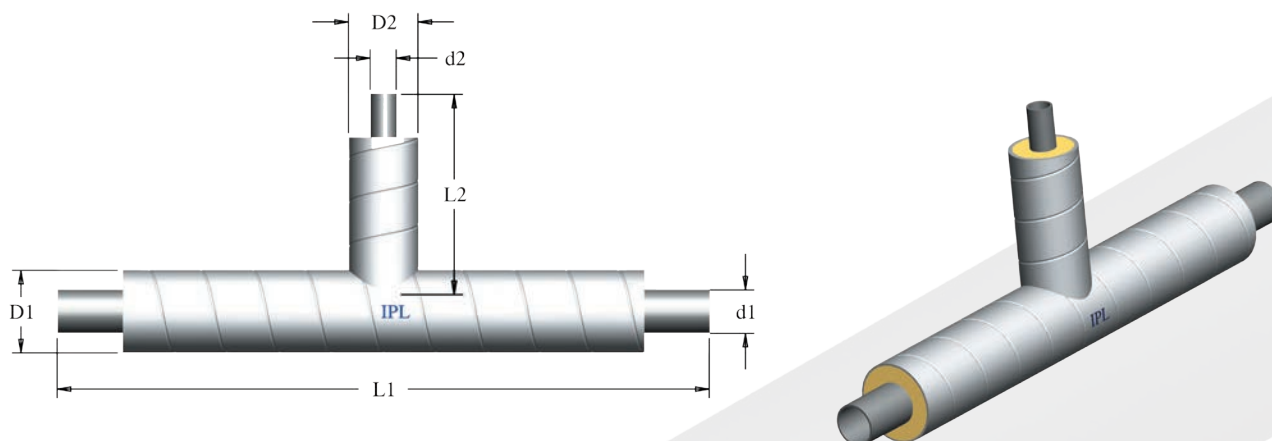
Carrier pipe			Jacket	Weight	Standard length
dn	d	S _{min} *	D	M	L
[mm]	[mm]	[mm]	[mm]	[kg/m]	[m]
20	26,9	2,6	100	2,7	6
25	33,7	2,6	100	3,1	6
32	42,4	2,6	125	4,0	6/12
40	48,3	2,6	125	4,4	6/12
50	60,3	2,9	125	5,8	6/12
65	76,1	2,9	140	7,5	6/12
80	88,9	3,2	160	9,5	6/12
100	114,3	3,6	200	13,6	12
125	139,7	3,6	224	16,8	12
150	168,3	4,0	250	20,6	12
200	219,1	4,5	315	31,8	12
250	273,0	5,0	400	46,0	12
300	323,9	5,6	450	59,0	12
350	355,6	5,6	500	67,0	12
400	406,4	6,3	560	85,0	12
450	457,0	6,3	630	99,0	12
500	508,0	6,3	710	109,0	12
600	610,0	7,1	800	150,0	12
700	711,0	8,0	900	190,0	12
800	813,0	8,8	1000	240,0	12
900	914,0	10,0	1120	300,0	12
1000	1016,0	11,0	1250	360,0	12

2.2 - ELBOW FROM 5° TO 90°



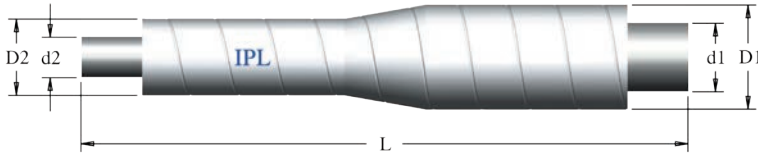
Carrier pipe			Jacket	Radius	Arm length
dn	d	S _{min}	D	R	L
[mm]	[mm]	[mm]	[mm]	-	[m]
20	26,9	2,6	100	3d	1,00
25	33,7	2,6	100	3d	1,00
32	42,4	2,6	125	3d	1,00
40	48,3	2,6	125	3d	1,00
50	60,3	2,9	125	3d	1,00
65	76,1	2,9	140	3d	1,00
80	88,9	3,2	160	3d	1,00
100	114,3	3,6	200	3d	1,00
125	139,7	3,6	224	1,5d	1,00
150	168,3	4,0	250	1,5d	1,00
200	219,1	4,5	315	1,5d	1,00
250	273,0	5,0	400	1,5d	1,00
300	323,9	5,6	450	1,5d	1,00
350	355,6	5,6	500	1,5d	1,00
400	406,4	6,3	560	1,5d	1,00
450	457,0	6,3	630	1,5d	1,10
500	508,0	6,3	710	1,5d	1,20
600	610,0	7,1	800	1,5d	1,30
700	711,0	8,0	900	1,5d	1,50
800	813,0	8,8	1000	1,5d	1,60
900	914,0	10,0	1120	1,5d	1,80
1000	1016,0	11,0	1150	1,5d	2,20

2.3 - STRAIGHT TEE



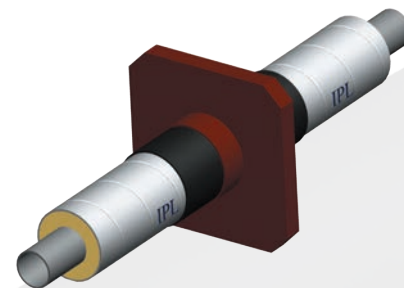
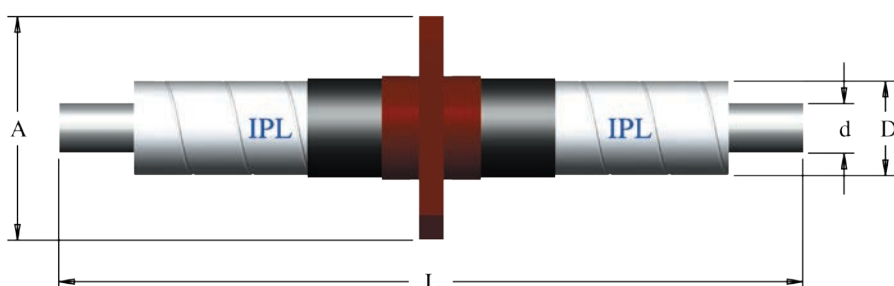
Main pipe			Branch pipe		
Diameter		Length	Diameter		Length
d1	D1	L1	d2	D2	L2
[mm]	[mm]	[m]	[mm]	[mm]	[m]
26,9	100	1,00	26,9	100	1,00
33,7	100	1,00	26,9 - 33,7	100	1,00
42,4	125	1,00	26,9 - 33,7	100	1,00
48,3	125	1,00	26,9 - 42,4	100 - 125	1,00
60,3	125	1,00	26,9 - 48,3	100 - 125	1,00
76,1	140	1,00	26,9 - 60,3	100 - 125	1,00
88,9	160	1,00	26,9 - 76,1	100 - 140	1,00
114,3	200	1,00	26,9 - 88,9	100 - 160	1,00
139,7	224	1,00	26,9 - 114,3	100 - 200	1,00
168,3	250	1,00	26,9 - 168,3	100 - 250	1,00
219,1	315	1,50	26,9 - 168,3	100 - 250	1,00
273,0	400	1,50	26,9 - 168,3	100 - 250	1,00
323,9	450	1,50	26,9 - 168,3	100 - 250	1,00
355,6	500	1,50	26,9 - 219,1	100 - 315	1,00
406,4	560	1,50	26,9 - 219,1	100 - 315	1,00

2.4- REDUCER



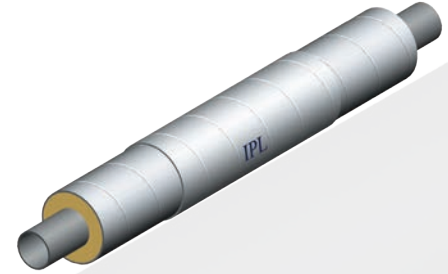
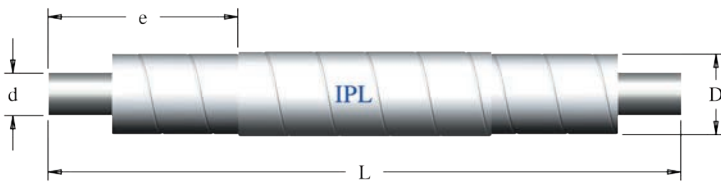
Carrier pipe		Minimum reduction diameter		Length
d1	D1	d2	D2	L
[mm]	[mm]	[mm]	[mm]	[m]
26,9	100	-	-	-
33,7	100	26,9	100	1,00
42,4	125	26,9	100	1,00
48,3	125	26,9	100	1,00
60,3	125	33,7	100	1,00
76,1	140	42,4	125	1,00
88,9	160	48,3	125	1,00
114,3	200	60,3	125	1,00
139,7	224	76,1	140	1,00
168,3	250	88,9	160	1,00
219,1	315	114,3	200	1,00
273,0	400	139,7	224	1,50
323,9	450	168,3	250	1,50
355,6	500	219,1	315	1,50
406,4	560	273,0	400	1,50
457,0	630	323,9	450	1,50
508,0	710	355,6	500	1,50
610,0	800	406,4	560	1,50

2.5 – PUDDLE FLANGE



Carrier pipe			Jacket	Dimension	Length
dn	d	s	D	A	L
[mm]	[mm]	[mm]	[mm]	[mm]	[m]
20	26,9	2,6	100	140	2,00
25	33,7	2,6	100	140	2,00
32	42,4	2,6	125	160	2,00
40	48,3	2,6	125	160	2,00
50	60,3	2,9	125	180	2,00
65	76,1	2,9	140	190	2,00
80	88,9	3,2	160	240	2,00
100	114,3	3,6	200	280	2,00
125	139,7	3,6	224	305	2,00
150	168,3	4,0	250	330	2,00
200	219,1	4,5	315	395	2,00
250	273,0	5,0	400	480	2,00
300	323,9	5,6	450	530	2,00
350	355,6	5,6	500	580	3,00
400	406,4	6,3	560	640	3,00
450	457,0	6,3	630	710	3,00
500	508,0	6,3	710	790	3,00
600	610,0	7,1	800	890	3,00

2.6 – STRAIGHT JOINT



End diameter		Compensation		Length	
dn	d	D	e standard	e max	L
[mm]	[mm]	[mm]	[mm]	[mm]	[m]
32	42,4	125	100	100	2,00
40	48,3	125	100	100	2,00
50	60,3	125	100	100	2,00
65	76,1	140	100	125	2,00
80	88,9	160	100	125	2,00
100	114,3	200	125	125	2,00
125	139,7	224	125	125	2,00
150	168,3	250	125	150	2,50
200	219,1	315	125	150	2,50
250	273,0	400	125	175	2,50
300	323,9	450	125	175	2,50
350	355,6	500	125	175	3,00
400	406,4	560	125	175	3,00
450	457,0	630	125	200	3,00
500	508,0	710	125	200	3,00
600	610,0	800	125	200	3,00

INSTALLATION

TOOLS REQUIRED

- Standard mechanical tool box.
- Standard electricians tool box.
- Fusion machine large enough to accommodate insulated pipe sizes as required. Temperatures and pressure settings as recommended by the pipe supplier.
- Chain saw to cut pipe.
- Caulking gun.
- Large propane torch.
- Electrician's fish wire if electric traced.
- 44 mm (34/ in) carpenters chisel and hammer.
- Carpenters saw and keyhole saw.

INSTALLATION OF HEAT SHRINK SLEEVES

The sleeves supplied are adhesive bonded wrap around shrink sleeves lined with a thick layer of aggressive hydrophobic adhesive. Wrap around sleeves are specifically designed for the sealing of thermally insulated pipe joints and are particularly well suited for use on larger diameters. The sticky adhesives are designed to wet-out and bond to polyethylene, urethane, etc., quickly and with a minimum of heat. The extra thickness of the adhesive ensures sealing. The closure seal is coated with a high softening point, hot melt adhesive which bonds easily and powerfully to the sleeve to protect the overlap from being peeled back while in service. Wrap around sleeves can be installed quickly and easily by installers who require only a short training session.

FUSION

Polyethylene pipe and fittings are normally joined by the heat fusion method (called butt fusion.) The principle in any type of heat fusion is to heat two surfaces to their melting temperature, then make contact between the two surfaces and allow them to fuse together, under pressure if necessary. On cooling, the original interfaces are gone and the two parts are united. The fusion process does not alter the physical properties of polyethylene.

MECHANICAL JOINING

Mechanical joining may use with Iron Pipe Size (IPS) polyethylene pipe in sizes from 50 to 300 mm (2 to 12 in). Compression couplings may be used on smaller sizes (50 mm (2 in) and below), in both IPS (Iron Pipe Size) and CTS (Copper Tube Size.) The type (IPS or CTS) and series of the pipe must be indicated when ordering stainless steel insert stiffeners to ensure a proper fit.

EXCAVATION

Pre-insulated polyethylene piping should be laid and continuously supported on undisturbed or well compacted soil. The width of ditch can be minimal for the diameter pipe used; but good practice allows some width for slack in line and sufficient space to compact the side fill. Backfill material should be soft dirt or sand, free of stones that may damage the insulation. Clean backfill material should surround the pipe to at least 100 mm (4 in) above the pipe. Other less suitable or native materials may be used for completing the backfill once the pipe has been properly bedded in the ground. Compacting with heavy equipment is not generally recommended unless the pipe has 500 mm (20 in) of cover and is under 103 kPa (15 psi) or more pressure. Care must be taken not to let rocks or other foreign material fall on the pipe which might damage the insulation jacket.

JOINT INSULATION

Site joint insulation such as straight joints, elbows, reducers and tee joints are the common joints. For site joint insulation we are fabricated the casing for fittings at site or in our factory as per the site requirements. For all joints there is 100 mm over lab is keeping on both ends and the length of the joints are standard.

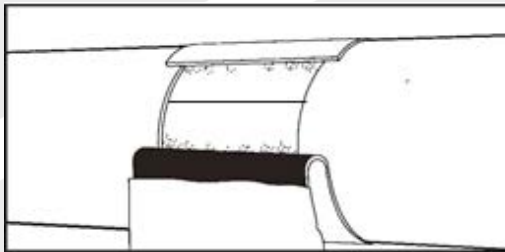
INSTALLATION OF HEAT SHRINK SLEEVES

The sleeves supplied are adhesive bonded wrap around shrink sleeves lined with a thick layer of aggressive hydrophobic adhesive. Wrap around sleeves are specifically designed for the sealing of thermally insulated pipe joints and are particularly well suited for use on larger diameters. The sticky adhesives are designed to wet-out and bond to polyethylene, urethane, etc., quickly and with a minimum of heat. The extra thickness of the adhesive ensures sealing. The closure seal is coated with a high softening point, hot melt adhesive which bonds easily and powerfully to the sleeve to protect the overlap from being peeled back while in service. Wrap around sleeves can be installed quickly and easily by installers who require only a short training session.

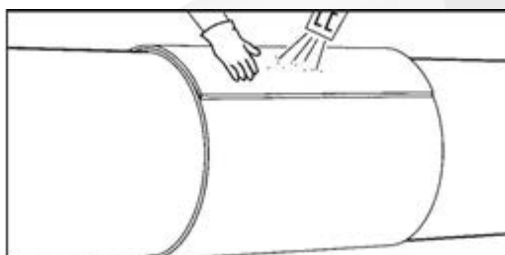
1. Put the closure seal where it will not be 50 mm (2 in) section of the pipe joint bead at the point where the conduit section will be installed.



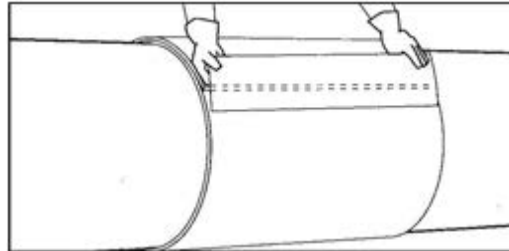
2. Peel back the release liner 75 or 100 mm (3 or 4 in), hold the sleeve vertically and center on the insulation joint. Press the sleeve to the far side of the top of the pipe (approx. 11 o'clock).



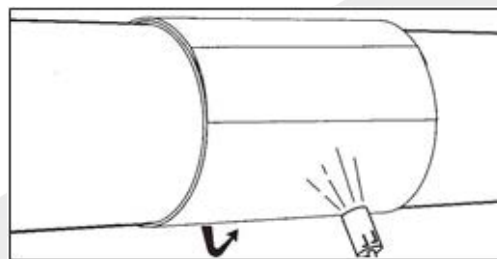
3. Wrap the sleeve around the joint, removing the release liner as it is wrapped. Leave liner on the last 300 mm (12 in) of sleeve and allow to hang free
4. Heat the overlap area with a propane or butane torch, pressing down firmly with a gloved hand until bonded. Smooth out wrinkles until melted adhesive appears at the edges.



- Remove remaining release liner and complete the wrapping operation. Heat the overlap gently, eliminating wrinkles as before.



- Peel back the release liner and center the closure seal over the overlap and press down firmly. Heat until well bonded.



- With the torch start at the center of the sleeve at least 100 mm (4 in) away from the overlap area and shrink it circumferentially all around the remaining diameter of the pipe. Keep the torch moving using broad circumferential strokes to avoid burning
- Continue shrinking the sleeve (from the center out) until about 50 mm (2 in) are left, then aim the torch inwards (toward the center of the sleeve) to bring this remainder down. Repeat this operation on the other end of the sleeve. Pay special attention to the area where the sleeve overlaps itself, ensuring no void remains along that line.

INSULATION OF FITTINGS WITH INSULATION KITS

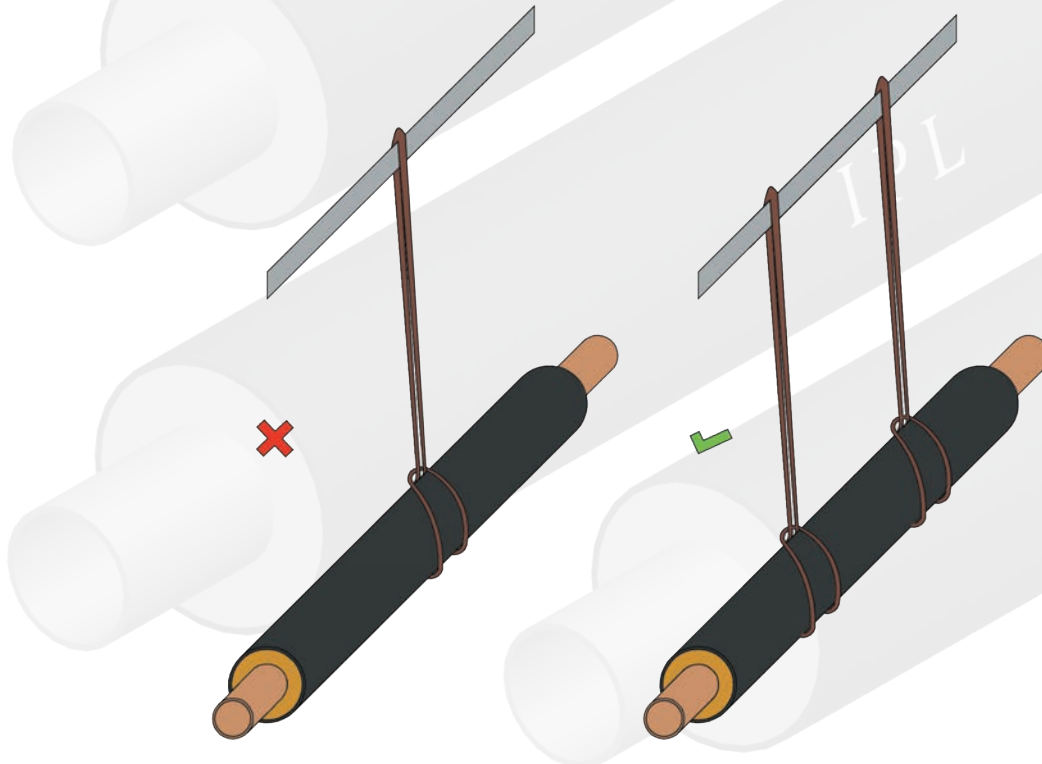
Polymer coated insulation kits are available to insulate almost any butt fused or flanged polyethylene fitting. They are also available to insulate such specials as saddles, curb stops, fire hydrants and any number of other fittings. The design of the kits varies from one configuration to another, general installation instructions for butt fused and flanged polyethylene fitting insulation kits, as well as flanged cast iron insulation kits are available.



STORAGE, HANDLING & TRANSPORTATION

HANDLING

- While handling pipes always be careful to avoid pipes from damages and other accidents.
- Although the polyethylene outer jacket pipe is strong, extra care must be taken to prevent damage to the jacket and insulation.
- Do not drop or drag the pipes.
- Never throw or drop the pipes/fittings from the vehicles.
- When pipes exceed personnel handling weight capacity, use either nylon belt type slings or fork lift trucks with smooth forks.
- The pipe may be unloaded from the trucks or containers by hand, or with the use of a lifting apparatus and 15 mm (6 in) wide fabric slings.
- Do not use metal slings, hooks or chains when handling pipes.
- Pipes received in containers should be removed by sliding them approximately half way out by hand, then supporting them on a fork lift truck on which an extended pallet with a flat bearing surface has been installed. A 44 mm (34/ in) sheet of 1.22 m x 2, 44 m (4 ft x 8 ft) plywood fastened to the top of the pallet will often suffice.
- If the pipes are “stuck” to one another within the container, a light spraying with a hose will help to make the pipes more slippery for removal



TRANSPORTATION

- In order to not impair the quality of the finished goods during transportation, the loading area on the vehicle must be checked to ensure that it is clean and any dirt or sharp edged parts must be removed.
- The media pipes are protected against external influences by pipe caps placed on the end of the pipes and shaped parts. These protective caps may not be removed until the parts are inserted.
- The vehicles which are used for transporting pipes must have a flat bed and supports .The supports in the vehicle must be free from sharp edges and sharp projection.
- Make sure vehicles have adequate side supports at approximately 2 meter spacing, and that all uprights are flat, with no sharp edges. Secure pipe during transit.
- Always load pipes with larger diameter and thicker walls before those with smaller diameters and thinner walls.
- The pipes in the vehicle should not overhang more than one meter.



STORAGE

In general, finished pipes of the same dimension are stored on solid surfaces. It is possible to store the pipes either in a rectangular pile or in the form of a pyramid. In both cases it is essential that the lowest layer of a pile is made safe by using wedges or supports to prevent them from rolling away or slipping. Timber planks should have at least the following dimensions: 15cm (width) x 2.5 cm (height). The number of timber planks required to assure the quality of the pipes is different depending on the dimensions and lengths of pipes. The planks must be laid in a straight line at equal intervals. The following data can be used as a rule of thumb:

Pipe lengths	Timber planks
6 m	mind. 3
12 m	mind. 5
16 m	mind. 7



Timber planks of the same type must be used for each stack of pipes in a rectangular or pyramid form. In order to safeguard the individual storage stacks, the pipes on the outside must also be prevented from rolling away to one side by attaching wedges. Nails must be hammered into the wedges to establish a secure connection between the planks and the wedges. At least two wedges per stack are required on each side to safeguard against any sideways movement.

When storing and transporting the pipes, care must be taken to ensure that the pipes are placed on the correct base. The stacks may not exceed 2.50 m in height. Assuming that the finished pipes have to be stored in the open air for long time period; relevant measures must be taken to prevent any loss of quality because of the effect of various types of weather (e.g. rain, frost).

The material to be assembled later in particular must be kept dry and protected from cold, heat and direct sunlight. Pipes in different sizes should be stored separately. Where this is not possible larger or thicker walled pipes should be placed at the bottom of the stack and pipes stack should not exceed 3 meters height.

Pipes should be kept away from stones or sharp projections.

Do not place the pipes in contact with lubricating or hydraulic oil, gasoline, solvent or other aggressive materials.

Keep pipes away from intense heat.

Special care must be taken when handling pipes in humid or wet condition, because the pipes may become slippery.

QUALITY ASSURANCE SYSTEM

Manufacturing of pre insulated components new product designing and technical services offered by IPL are governed by a Management System which is in line with EN ISO 9001:2008 and EN ISO 14001 standards.

The aim of IPL is an ongoing improvement of offered products by choosing top quality materials and modernization of manufacturing technology in order to meet our Customers' expectations.

The company cooperates with reliable and well-known suppliers who holding ISO 9001 quality certification and ensure top quality of supplied materials. All supplied materials are furnished with test certificates. We can provide our Customers with test certificates for materials upon request.

Our product manufacturing involves constant inspection in accordance with following Inspection and Test Schedules: Inspection on Delivery of Supplies, During Production Checks and Final Product Inspection.


The company attaches great significance to operation in an environment friendly manner.

In all activity fields connected with manufacturing, technical service and administration, IPL put special attention to ecological aspects in line with provisions of ISO 14001 standard.

One of the most important priorities for the company is setting out environmental goals and programs and their consistent implementation.

CERTIFICATES

Certificate of Registration




The Governing Board of
Q.A. International Certification Limited
hereby grants to:


IPL INTERNATIONAL PIPELINE SUPPLY
Registration No.: QAIC / PK / 2071 - A

(hereinafter called the Registered Company) the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the Registered Company at or from only the address given below in accordance with the health & safety management system in compliance with GB/T28001-2011 (OHSAS 18001:2007).

Address to which this Certificate refers :
Jebel Ali Freezone South, Dubai - UAE



Approved Scope to which this Certificate refers.
**Manufacture of Pre-insulated Pipes
Stocking of Pipes, Fittings and Valves**



 CHAIRMAN
A. J. Duffield


 SCHEME MANAGER
A. Carter


Certificate Issue Date : 6th July 2013 - Certificate Expiry Date : 26th June 2014
Date of Initial Registration : 6th July 2013 - Re-assessment Date : 26th June 2016
This Certificate of Registration is granted subject to the Regulations approved by the Board.

QA INTERNATIONAL
Q.A. International Certification Ltd.
Dudley Green
Dudley Road
Dunstable
Gt. Dunham
DL1 6QZ
Tel: +44 (0)1525 364272
Fax: +44 (0)1525 480980
www.qaic.co.uk



Certificate of Registration



The Governing Board of
Q.A. International Certification Limited
hereby grants to:


IPL INTERNATIONAL PIPELINE SUPPLY
Registration No.: QAIC / PK / 1721- A


(hereinafter called the Registered Company) the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the Registered Company at or from only the address given below in accordance with the quality management system in compliance with ISO 9001:2008.

Address to which this Certificate refers :
Jebel Ali Freezone South, Dubai, U.A.E.

Approved Scope to which this Certificate refers.
**Manufacture of Pre-insulated Pipes
Stocking of Pipes, Fittings and Valves**
(Further clarification regarding the Scope of this Certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organisation)



Signed for and on behalf of the Board



 CHAIRMAN
A. J. Duffield


 SCHEME MANAGER
A. Carter


Certificate Issue Date : 24th April 2013 - Certificate Expiry Date : 23rd April 2014
Date of Initial Registration : 13th May 2011 - Re-assessment Date : 23rd April 2014
This Certificate of Registration is granted subject to the Regulations approved by the Board.

QA INTERNATIONAL
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www.qaic.co.uk



Certificate of Registration



The Governing Board of
Q.A. International Certification Limited
hereby grants to:


IPL INTERNATIONAL PIPELINE SUPPLY
Registration No.: QAIC / PK / 1723- A


(hereinafter called the Registered Company) the right to be listed in the Directory of Registered Companies in respect of the services listed below. These services shall be offered by the Registered Company at or from only the address given below in accordance with the environmental management system in compliance with ISO 14001:2004.

Address to which this Certificate refers :
Jebel Ali Freezone South, Dubai, U.A.E.

Approved Scope to which this Certificate refers.
**Manufacture of Pre-insulated Pipes
Stocking of Pipes, Fittings and Valves**



Signed for and on behalf of the Board



 CHAIRMAN
A. J. Duffield


 SCHEME MANAGER
A. Carter

Certificate Issue Date : 29th April 2013 - Certificate Expiry Date : 6th May 2014
Date of Initial Registration : 13th May 2011 - Re-assessment Date : 6th May 2014
This Certificate of Registration is granted subject to the Regulations approved by the Board.

QA INTERNATIONAL
Q.A. International Certification Ltd.
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Fax: +44 (0)1525 480980
www.qaic.co.uk



The IPL logo consists of the letters 'IPL' in a bold, blue, serif font. To the right of the letters is a stylized graphic element: a white curved shape that tapers to a point, resembling a quarter of a circle or a stylized 'L' shape.

PRE-INSULATED SYSTEMS

IPL - PRE INSULATED PIPES

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