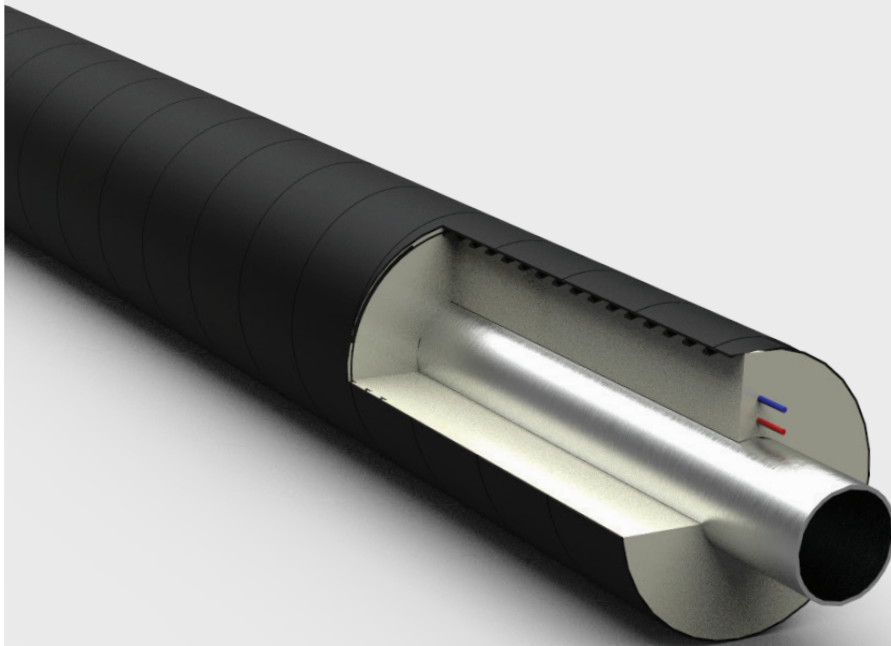


TASHI-LOC™ **New**

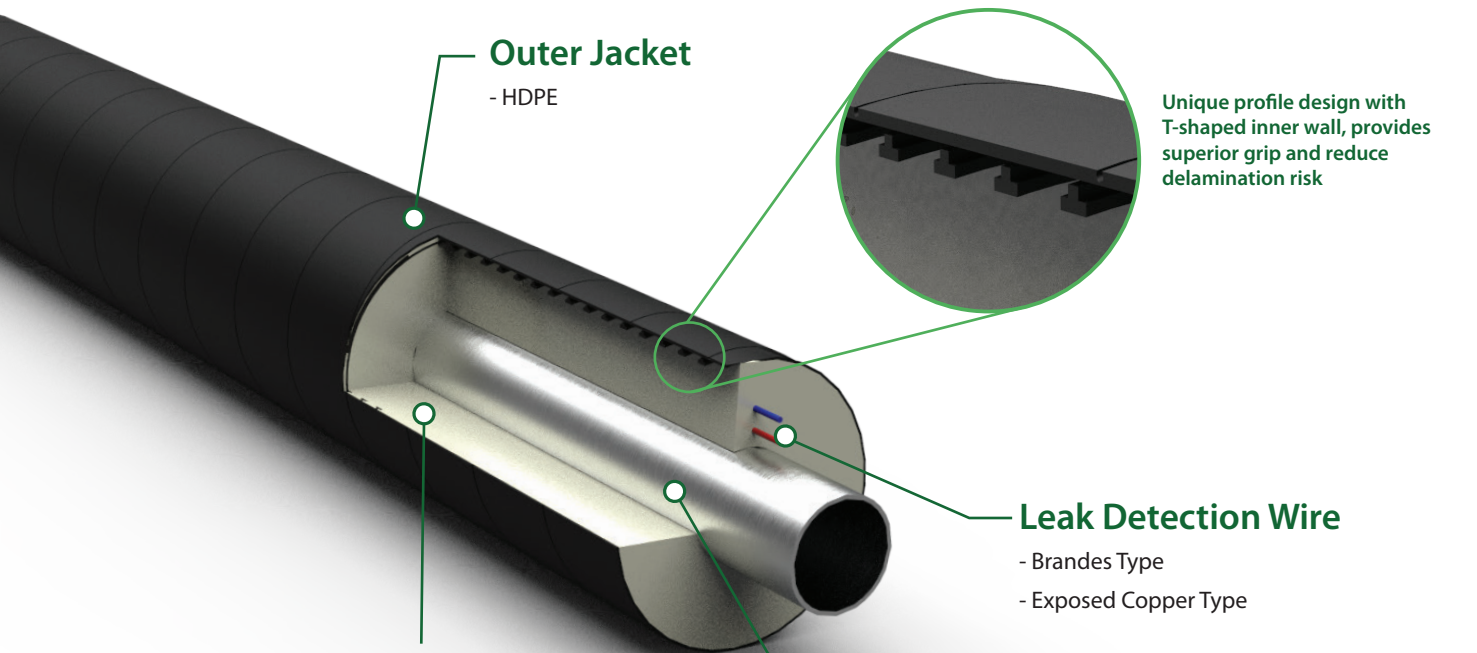


TASHI-LOC™ New

Tashi, a brand renowned for its forward-thinking approach to performance and sustainability, is thrilled to present its latest product range: Tashi-Loc. Offering an innovative pre-insulated piping solution, Tashi-Loc is crafted using HDPE, one of the most recyclable types of plastic, to deliver superior performance.

Tashi-Loc features a rigid spiral HDPE (High Density) jacket construction with a unique profile design that includes a smooth external wall and T-shaped inner wall. This innovative design provides a superior grip for the injected polyurethane (PU) and reduces the risk of delamination defects, while the spiral construction ensures unparalleled straightness consistency.

Designed for ease of use and maximum efficiency, the Tashi-Loc range is lightweight and simple to fabricate, assemble, and install. It maintains uniform roundness with minimal losses, avoiding the common issue of out-of-tolerance roundness found with traditional HDPE pipe extrusions. Tashi-Loc is the eco-friendly solution that sets the bar high for excellence in the pre-insulated piping industry.



Outer Jacket

- HDPE

Unique profile design with T-shaped inner wall, provides superior grip and reduce delamination risk

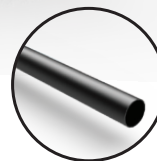
Leak Detection Wire

- Brandes Type
- Exposed Copper Type

Polyurethane Insulation

Machine injected polyurethane foam that foams in place, fills up the entire space between carrier pipe and outer jacket.

Carrier Pipe Options:



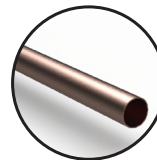
Carbon Steel



Stainless Steel



Ductile Iron



Copper



HDPE



Epoxy Cast Iron

Polyurethane foam properties

Insulation density	60kg/m ³
Thermal conductivity	0.021W/m.K at 10°C mean
Service temperature	-50°C to 100°C
Fire propagation	Class "O" rating
Fire rating	2 hours at 1000°C

Recommended insulation thickness

up to Dia. 50mm	Series 40
from Dia. 65mm to 150mm	Series 50
from Dia.200mm & above	Series 65



Product Data

Casing Material			PU Density STD				
HDPE			50mm - 600mm @ 45kg/m ³				
Pipe STD	Pipe Size	Pipe OD	Jacket Size	Insulation Thickness	Heat Gain / Loss	Weight / Meter	Weight / Meter
		MM	MM	MM	kcal/h	with water	without water
API 5L Gr B 7.9mm	600	609	710	43.5	-18.56	414.09	137.16
API 5L Gr B 7.9mm	550	558	710	69.0	-12.24	361.17	129.60
API 5L Gr B 7.9mm	500	508	630	54.0	-13.34	306.21	115.94
API 5L Gr B 7.9mm	450	457	560	45.5	-13.60	254.62	101.60
API 5L Gr B 7.9mm	400	406	500	41.0	-13.09	209.7	89.87
JIS G3452 Std -Blk	350	355	500	66.5	-8.40	172.15	81.47
JIS G3452 Std -Blk	300	323	450	57.5	-8.57	136.58	63.66
JIS G3452 Std -Blk	250	273	400	58.5	-7.38	102.76	51.89
JIS G3452 Std -Blk	200	219	315	44.0	-7.47	69.08	35.97
BS 1387 Clss C - Blk	150	168	280	52.0	-5.50	45.75	26.74
BS 1387 Clss C - Blk	125	141	225	38.5	-5.84	34.90	21.59
BS 1387 Clss C - Blk	100	114	200	39.8	-4.92	25.86	17.45
BS 1387 Clss C - Blk	75	89	160	32.5	-4.69	17.47	12.51
BS 1387 Clss C - Blk	65	73	140	30.5	-4.26	13.28	9.73
BS 1387 Clss C - Blk	50	60	140	37.0	-3.37	10.10	7.04

Engineering Data

Pipe Size	Jacket Size	PU Thickness	Straight Joint	Elbow Joint	Tee Joint	Reducer Joint
MM	MM	MM				
600	710	43.5	4.59	7.97	5.96	2.80
550	710	69.0	7.01	11.33	8.14	3.91
500	630	54.0	4.94	7.4	5.61	2.86
450	630	79.5	6.93	9.55	6.86	0.71
450	560	45.5	3.72	5.12	4.10	1.91
400	560	71.0	5.48	6.92	5.16	2.48
400	500	41.0	2.97	3.74	3.16	1.52
350	500	66.5	4.55	5.17	4.17	2.07
300	450	57.5	3.68	3.87	3.28	0.87
250	400	58.5	3.28	3.05	2.56	1.11
200	315	44.0	1.95	1.57	1.53	0.71
150	280	52.0	1.86	1.30	1.32	0.67
125	225	38.5	1.14	0.72	0.76	0.40
100	225	52.0	1.41	0.80	0.79	0.41
75	160	32.5	0.65	0.33	0.39	0.22
65	160	40.5	0.73	0.35	0.40	0.23
50	140	37.0	0.59	0.26	0.31	0.18

Note:

1. Please contact Tashi if you need more information or require a density greater than 45 kg/m³.

Engineering Data

Calculation Formulas for Pipe Heat Gain/Loss

Heat Gain/Loss per meter length

$$Q = \frac{\pi(T_w - T_a)}{\frac{1}{2} \lambda_p \times \text{LN} \left(\frac{D_2}{D_1} \right) + \frac{1}{2} \lambda_i \times \text{LN} \left(\frac{D_3}{D_2} \right) + \frac{1}{2} \lambda_h \times \text{LN} \left(\frac{D_4}{D_3} \right) + \frac{1}{2} \lambda_s \times \text{LN} \left(\frac{4H}{D_4} \right)}$$

Q = Heat gain or heat loss by insulation (Kcal/m.h)

T_w = Fluid temperature (°C) 5.0 °C

T_a = Ambient air temperature (°C) 30.0 °C

D₁ = Carrier pipe inner diameter (m)

D₂ = Carrier pipe outer diameter (m)

D₃ = Casing inner diameter (m)

D₄ = Casing outer diameter (m)

H = Buried depth to C/L of pipe (m) 1.00 m

λ_p = Thermal conductivity of steel (Kcal/m.h.°C) 45.00 Kcal/m.h.°C

λ_i = Thermal conductivity of insulation (Kcal/m.h.°C) 0.02 Kcal/m.h.°C

λ_s = Thermal conductivity of soil (Kcal/m.h.°C) 1.00 Kcal/h.°C

Temperature different, dT (F) = Total Heat Gain/Loss (Kcal/h) x 3.964 x 20 / Flowrate (igpm) /12000

dT (In/Out)	Flow Rate (igpm)	PRE-INSULATED PIPE DETAILS							Pipe Length (m)	Total Heat Gain / Loss (Kcal/h)	Temp Different (°F) (Kcal/h)
		Pipe			Jacket		Insulation				
		Nom	ID	OD	ID	OD	Thk	Thk			
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)			
10			D1	D2	D3	D4					
Ton (RT)											
1000	2000	600	589.94	609	696	710	7	43.5	100	-1781.84	-0.0061

TASHI-LOC™ Specification

Underground Piping System

All thermally insulated underground piping systems shall be of the Tashi-Loc™ fill-in type without an air gap or an approved equivalent. The thermal insulating jacket must be a non-metallic, sectional, factory-preinsulated, and prefabricated type. It must be structurally strong, watertight, and completely resistant to corrosive elements typically encountered underground. The system shall include the carrier pipe, insulation, jacket, anchors, fittings, wall seals, expansion provisions, and field joining materials. Tashi-Loc™ system components must possess the physical properties specified below. The Tashi-Loc™ system must be installed strictly following the manufacturer's recommendations and instructions. The preinsulated pipes shall be from a manufacturer who has been producing preinsulated pipes for at least the past 10 years.

Carrier Pipe

Unless otherwise specified, the carrier pipe shall conform to one of the following standards:

- API 5L Grade B
- ASTM A106
- ASTM A53 Grade B Standard ERW / seamless black
- BS 1387 Class Medium / Heavy
- For pipe sizes 26" and larger, the carrier pipe shall be API 5L Grade B SAW. The minimum wall thickness shall be 9.5mm.

All carrier pipe ends shall be beveled for field welding in accordance with ASTM or JIS standards and shall be properly protected.

Remarks

Select most suitable carrier pipe.

Insulation

The insulation shall be polyurethane foam, injected by a foaming machine in one continuous process and foamed in place to completely fill the annular space between the carrier pipe and the jacket. The insulation shall have the following characteristics:

- i. Density: Minimum 45 kg/m³ (4.7 lb/ft³)
- ii. Thermal Conductivity: 0.02 W/mK or 0.017 kcal/m.hr.°C
- iii. Compressive Strength: 2.0 kg/cm² (29 psi)
2.8 kg/cm³ (40 psi) for 50 kg/m³
5.0 kg/cm³ (71 psi) for 75 kg/m³
- iv. Closed Cell Content: Min 90% by volume
- v. Insulation Thickness: Insulation thickness shall be selected on economical bases in such a manner to ensure that heat gain at maximum 5°C does not exceed recognized standard.

Remarks

Specify if higher density is required.
50 kg/m³, 75 kg/m³

a) 0.021 W/m. °K
for 50 kg/ m³

b) 0023 W/m. °K
for 75 kg/ m³

Pipe Size (NB)	Thickness
15mm - 300mm	25mm
350mm and over	35mm

TASHI-LOC™ Specification

Outer Jacket

Jacket shall be extruded high density polyethylene tube complying to:

MS	1058
ASTM	D 1248 TYPE CLASS 3
JIS	K 6761
BS	3284/1967 TYPE 50
DIN	8074/75
EN	253
ISO	4427

Remarks

Indicate if a PVC jacket or an alternative type of jacket is preferred.

Fittings

All fittings shall be prefabricated and preinsulated. Prefabricated and preinsulated elbows, loops, and tees shall be provided and installed as indicated on the plans. These fittings shall consist of pipe, insulation, and a jacket conforming to the same specifications previously outlined for straight runs. Expansion loops shall be properly designed in accordance with the stress limits specified by The Code for Pressure Piping, ANSI B31.1. Loop piping shall be installed in jackets suitably sized to accommodate the indicated pipe movement.

Alternate: Where space does not permit the use of loops, expansion joints shall be provided in manholes.

Remarks

If expansion loops cannot be used due to limited space, specify bellows, ball joints, or other expansion joints.

End Seals and Gland Seals

Terminal ends of the jacket inside manholes, pits, or building walls shall be equipped with end seals consisting of a heat-shrinkable polyethylene bulkhead installed to the pipe and jacket. If there is no anchor within 1.5 meters of a terminal end, the jackets shall be equipped with gland seals consisting of a packed stuffing box and gland follower mounted on a steel plate installed at the end of the jacket. Terminate all jackets 100mm beyond the inside face of manhole or building walls to protect any exposed piping insulation from damp-wall condensation. If the pipe is cut due to field alteration, an end seal (shipped loose) must be applied prior to welding the carrier pipe, or an elastomeric compound furnished by the manufacturer must be applied.

Leak Plates and Rubber Link-Seal

To ensure an effective moisture barrier, a wall sleeve with a leak plate must be installed at building or manhole walls. The wall sleeve and leak plate shall consist of a steel sleeve and a steel plate flange that is 100mm larger in outside diameter than the steel wall sleeve. A rubber seal must be installed between the jacket and the wall sleeve to prevent the ingress of water and moisture.

Field Joints

Field joints must be executed strictly following the manufacturer's recommendations. Straight joints shall be field-insulated using polyurethane foam, a split PE connector band, and a polyethylene shrink sleeve.



TASHI-LOC™ Specification

Manufacturer's Field Installation Instructor

A Manufacturer's Field Service Instructor must be present during critical phases of installation and testing of the system. This individual should be factory-trained and technically qualified to ensure that the installation adheres to the manufacturer's recommendations. Upon completion of the installation, the contractor must provide the owner with a certificate from the manufacturer confirming that the installation complies with the manufacturer's guidelines.

Manufacturer's Shop Drawings

The manufacturer prepares drawings for approval for each project, adhering to the requirements outlined in the contract plans and specifications. Once the drawings and descriptive brochure are approved, part numbers are assigned to each unit. These part numbers are indicated on the drawings, which then become shop drawings. Each unit is marked and tagged to match the part numbers shown on the shop drawing. Shop drawings, including the part numbers, are included with the actual shipments.