QUOTE TO:
ANDREWS MECHANICAL, INC
E 1503 WABASH
SPOKANE, WA 99207

SHIP TO:
ANDREWS MECHANICAL
2727 N. MADELIA SUITE 8
SPOKANE, WA 99207

CUSTOMER NUMBER	CUSTOMER ORDER NUMBER	RELEASE NUMBER	SALESPERSON
28451	Pipe Insulation		

WRITER	SHIP VIA	TERMS	SHIP DATE	FREIGHT ALLOWED
		2% 10th Net 30,	02/26/14	No

ORDER QTY	PART NO	DESCRIPTION	NET PRC	EXT PRC
		*** This quote expires on 03/05/14 ***		
1ft	580781	1-1/8IDx1/2 WALL GLUED INSULATION Pn:	0.401	0.40
1ft	580879	1-1/8IDx1 WALL GLUED INSULATION Pn:	1.075	1.08
		TAXES NOT INCLUDED		

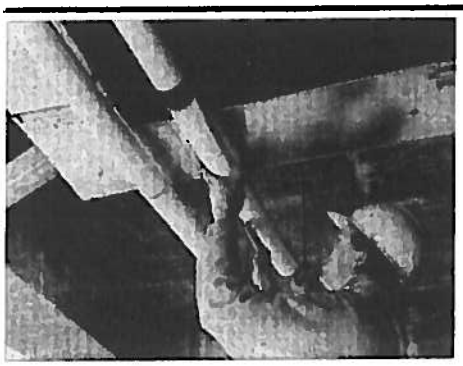
This quotation has been prepared for your convenience per our interpretation of the specifications sent to us. Your protection is a recheck of the material contained herein. Fixtures are white except where noted. Prices quoted are guaranteed for a period of (7) days, unless otherwise stated, from the date of this quote. Clerical errors are subject to correction.

Subtotal	1.48
S&H CHGS	0.00
Amount Due	1.48

SUBMITTAL SHEET

OWENS CORNING FIBERGLAS

Owens-Corning Fiberglas SSL-II® Pipe Insulation with Doublesure* Closure System



Uses

Fiberglas SSL-II pipe insulation is recommended for use on all hot, cold, concealed, and exposed piping operating at temperatures from 0 to 850F in commercial and institutional buildings, industrial facilities, and process or power plants.

Description

Owens-Corning Fiberglas SSL-II® Pipe Insulation is jacketed with reinforced all service vapor retarder jacketing. The jacketing has a factory-applied double pressure-sensitive adhesive system which provides positive closure and vapor sealing of the longitudinal joint, at ambient temperatures ranging from 25F to 110F. Joints between insulation sections are sealed with butt strips which also have a two-component adhesive system. This Doublesure* jacket closure system provides an extremely effective vapor seal, protecting the insulation against entry of moisture. It can also significantly improve installation productivity by eliminating in most cases the need for staples, mastics and bands.

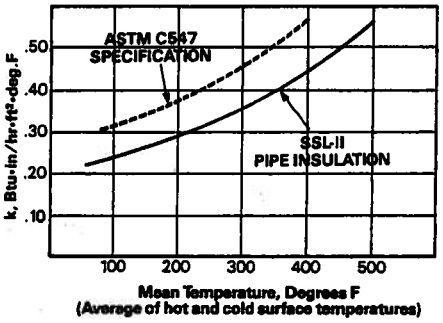
Physical Properties

Property	Test Method	Specification
Pipe operating temperature range	ASTM C 411	0 to 850F (1)
Jacket surface temperature limitation		-20F to +150F
Jacket permeance	ASTM E 96	0.02 perm
Puncture resistance	ASTM D 781	50 units
Composite surface burning characteristics	UL 723*	Flame spread 25* Smoke developed 50

(1) Limited to single layer applications above 650F, but not greater than 6" thickness.

*The surface burning characteristics of these products have been determined in accordance with UL 723. This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of these tests may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use. Values are reported to the nearest 5 rating.

Thermal Conductivity, k (ASTM C 335)



Specification Compliance

Fiberglas SSL-II pipe insulation complies with the property requirements of the following specifications:

**Preproduction qualification testing complete and on file. Chemical analysis of each production lot required for total conformance.

Availability

Fiberglas SSL-II pipe insulation is available in thicknesses from 1/2" to 5" for application to nominal pipe sizes from 1/2" up, as listed on the reverse side of this submittal sheet.

*Trademark registered Morgan Adhesives Co.

AEROCEL-SSPT®

Closed Cell Elastomeric Thermal Insulation for HVAC & R

General

AEROCEL® Tube Insulation is a highly flexible, closed-cell and lightweight EPDM-rubber based elastomeric product. Aerocel-SSPT® Tube Insulation is designed for insulating warm or cold piping, duct, or equipment. Aerocel-SSPT® EPDM Elastomeric Tube Insulation is supplied in 1/4", 3/8", 1/2", 3/4", 1", 1-1/4",1-1/2" ", 2", 2-1/2" and 3" thicknesses, in popular I.D. sizes up to 8" IPS. Please check for specific size combinations. The tightly formed, closed-cell structure of Aerocel-SSPT® Tube Insulation makes it an efficient insulation, providing superior insulating capacity to many materials, including other elastomeric insulations. Aerocel is manufactured to consistently provide actual values on these key performance criteria for mechanical system insulation:

Self-Seal with Protape (SSPT) affords the most secure self-seal, dual-tape closure available. Avoids call-backs or failures. Maintains its seal in harsh conditions.

Thermal Conductivity: 0.245
Water Vapor Transmission, Perms: 0.03
UV Resistance: Minimal change, ASTM G 7 and ASTM G 90
Fire Rating: Will not contribute significantly to fire (simulated end-use testing).

Aerocel-SSPT® Tube Insulation, in 1/4" through 2" thickness, has a flame spread rating of 25 or less and a smoke developed rating of 50 or less as tested by ASTM E 84 "Surface Burning Characteristics of Building Materials." Aerocel EPDM Pipe Insulation is acceptable for use in air distribution systems including ducts, plenums, air handling equipment and air terminal devices.

Uses

Aerocel-SSPT® Pipe Insulation is used to retard heat gain or loss, and to control condensation formation on cold-water plumbing, chilled water, and refrigeration lines. The material also efficiently reduces heat flow on hot water plumbing, liquid heating and dual-temperature piping systems. Aerocel® sheet is used to insulate large OD pipes, chillers, vessels and tanks, and can be used as a duct liner or duct wrap. The recommended service temperature range for Aerocel Insulation is -297°F to +257°F. ***Aerocel® is designed for installation above and below ground, indoors and outdoors. No protective finish is required.***

Aerocel-SSPT® Pipe Insulation is uniquely suited, over many other cellular or fibrous insulation materials, to dual-temperature HVAC piping systems. This unique fit results from Aerocel's proprietary combination of very low moisture vapor flow for times of cooling-mode operation, higher temperature usage properties during times of heating-mode operation, and superior insulating capacity in either operating mode.

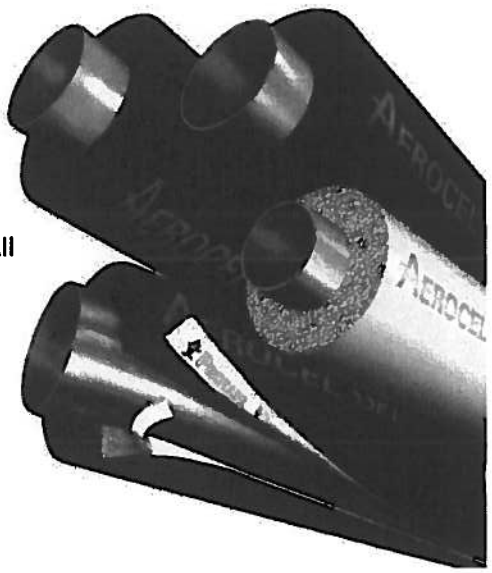
Aerocel-SSPT® Pipe Insulation is uniquely suited to Solar piping systems because of its proprietary combination of UV Resistance, greater thermal efficiency, non-corrosiveness to copper or stainless steel, and availability as single layer product in greater thicknesses.

Resistance to Moisture Vapor Flow

The unique cell structure of Aerocel® EPDM Insulation effectively retards the flow of moisture vapor. Aerocel is considered a low transmittance vapor retarder. In normal service conditions, Aerocel requires no supplemental vapor retarder protection. When used in extremely low-temperature or extremely high-humidity conditions, an additional vapor barrier maybe required.

Key Features

- UV Resistant – Added Weather Protection Not Required, Saves on First Cost and Maintenance
- Lower Thermal Conductivity – Saves Additional Energy Costs
- 257° Upper Use Limit – Greater Application Range – Cryogenic to Low Pressure Steam
- E 84 25/50 to 2" Thickness – Lowers Installation Costs with Fewer Layers
- Versatile for Heating, AC, Refrigeration, Solar, Plumbing – Single Product for All Systems
- Easy to install – Lowers Installation Costs, Keeps Job Cost as Estimated



c UL® US

Features & Benefits

UV Resistant	Tundra EPDM rubber pipe insulation won't break down when exposed to sunlight. No protective coating required in outdoor applications.
Moisture Resistant	Resists the decomposition moisture causes in other types of closed-cell elastomeric insulation. Tundra has the lowest moisture resistance in the industry (.03 perm rating).
Low Thermal Conductivity	With a .245 k-factor, Tundra offers the best insulation value for closed-cell elastomeric insulation.
Low Temperature Flexibility	Tundra EPDM rubber pipe insulation does not lose its flexibility in cold temperatures.
Extreme Temperature Resistance	Resists the aging effect caused by exposure to temperature extremes. Tundra has an upper temperature limit of 257°F, more than 30° higher than other closed-cell elastomeric insulation products. Tundra also works on dual-temperature systems.
ASTM E-84 Tested	Tundra has a 25/50 flame/smoke rating in thickness up to and including 2".

Industrial Thermo Polymers Limited
153 Van Kirk Drive, Brampton, Ontario L7A 1A4
Tel: 905.846.3666 Fax: 905.846.0363 Toll Free: 1.800.387.3847
Email: info@tundrafoam.com Web: www.tundrafoam.com

Application

AEROCEL-SSPT® Aerocel-SSPT® utilizes a unique 2 step sealing system to insure a permanent seal. Step 1 is an acrylic adhesive seam seal on the inside of the longitudinal joint. Step 2 is an EPDM flap that utilizes a cellular fusion adhesive that closes across the top of the longitudinal seam. This adhesive chemistry bonds the EPDM to the tube ensuring a seal for the life of the system. Butt joints and other seams are to be sealed with contact adhesive. Fittings can be fabricated from straight tubing or sheet. Larger diameter, curved, or flat surfaces can be insulated by adhering properly fabricated sheet sections to them. Consult the Aeroflex Installation Handbook for more complete installation details and instructions.

Aerocel® is designed for installation above and below ground, indoors and outdoors. No protective finish is required.

In addition to the specifications listed below, Aerocel also is approved by or conforms to the requirements of the following: ASTM C 534 Type I and II, NY City MEA #171-04-M, City of LA RR-8413, UL 181 Section 13 Mold Growth/Humidity, ASTM G 21 Fungal Resistance Test, UL181 Section 18 Air Erosion, NFPA 90A & 90B, MIL152B0J, CAN/ULC-S102-07.

Aerocel Sheet and Tube insulations meet the energy code requirements of International Energy Conservation Code(IECC) and ASHRAE for R-4 for Refrigeration Piping at 1" wall thickness.

PHYSICAL PROPERTIES		RESULT				TEST METHOD
Cell Structure		Closed Cell				
Thermal Conductivity	Mean temp.	-4°F (-20°C)	32°F (0°C)	75°F (24°C)	90°F (32°C)	ASTM C 518 / C 177 104°F (40°C)
BTU.in/ft.²hr. °F	K-value	0.22	0.23	0.245	0.25	0.265
Service Temperature, CONTINUOUS		-297°F to +257°F -57°C to +125°C				ASTM C 411 AEROCEL loses flexibility at -70°F. This does not affect the insulating properties of the material.
U.V. Resistance		PASS				ASTM G 7 / G 90
Ozone Resistance		No cracking				ASTM D 1171
Water Vapor Permeability		.03 perm (4.38×10^{-11})				ASTM E 96
Water Absorption (weight %)		.2%				ASTM C 209
Fire Safety Characteristics Through 2" thickness		UL-94 5 V-A, V-O				File E228536
		25/50				ASTM E84
		Self extinguishing				ASTM D 635
Corrosion of Stainless Steel		Non corrosive				ASTM C 692, DIN 1988
Nitrosamine Content		None detected				U.S. FDA CPG No. 7117.11 BSEN 12868
Flexibility		PASS				ASTM C 534

ASHRAE 90.1-2007 ENERGY EFFICIENCY INSULATION THICKNESS					
	Pipe Sizes				
	<1" ID	1" ID to <1-1/2" ID	1-1/2" ID to < 4" ID	4" ID to < 8" ID	≥ 8" ID
Operating Temperature	Space Heating (Insulation Thickness, Inches)				
201 Deg. F - 250 Deg. F	1-1/2"	1-1/2"	2"	2"	2"
141 Deg. F - 200 Deg. F	1"	1"	1"	1-1/2"	1-1/2"
105 Deg. F - 140 Deg. F	1/2"	1/2"	1"	1"	1"
Operating Temperature	Service Water Heating (Insulation Thickness, Inches)				
105 Deg. F+	1/2"	1/2"	1"	1"	1"
Operating Temperature	Cooling Systems (Insulation Thickness, Inches)				
40 Deg. F - 60 Deg. F	1/2"	1/2"	1"	1"	1"
≤40 Deg. F	1/2"	1"	1"	1"	1-1/2"

MINIMUM THICKNESS OF AEROCEL REQUIRED TO PREVENT CONDENSATION				
Design Conditions — 85 Deg. F, 70% RH, Low Air Movement				
	Pipe Operating Temperature			
	50 Deg.	36 Deg. F	0 Deg. F	-20 Deg. F
Insulation Thickness	Pipe Outside Diameters			
1/4"	3/8" - 1"	-	-	-
3/8"	3/4" - 6"	3/8" - 3/4"	-	-
1/2"	-	7/8" - 6"	-	-
3/4"	-	-	3/8" - 1-1/2"	3/8" - 1/2"
1"	-	-	1-5/8" - 6"	3/4" - 2-1/2"
1-1/4"	-	-	-	2-5/8" - 6"
Design Conditions — 80 Deg. F, 50% RH, Low Air Movement				
1/4"	3/8" - 6"	3/8" - 6"	-	-
3/8"	-	-	3/8" - 3/4"	-
1/2"	-	-	7/8" - 6"	3/8" - 1"
3/4"	-	-	-	1-1/8" - 6"
Design Conditions — 90 Deg. F, 80% RH, Low Air Movement				
1/2"	3/8" - 7"	-	-	-
3/4"	1" - 6"	3/8" - 2"	-	-
1"	-	2-1/8" - 6"	3/8" - 1/2"	-
1-1/4"	-	-	3/4" - 2"	3/8" - 7/8"
1-1/2"	-	-	2-1/8" - 6"	1" - 2-1/8"
2"	-	-	-	2-1/4" - 6"

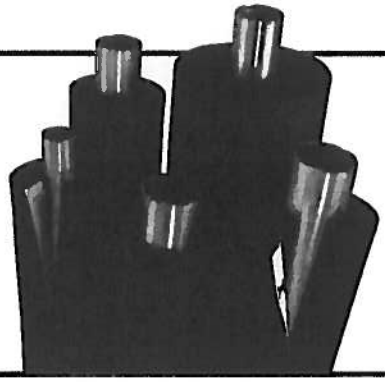
* Although in some areas of the country, 1/4" and 3/8" wall thicknesses are recommended, Aeroflex USA recommends 1/2" minimum wall thickness for optimum performance.

AEROFLEX USA, INC.
282 Industrial Park Road • Sweetwater, TN 37874
Tel: (423) 337-2493 • Fax: (423) 337-7675
Toll Free: (866) AEROCEL
Website: www.aeroflexusa.com

Tundra Seal

EPDM Rubber Pipe Insulation

Closed Cell Elastomeric Thermal Insulation for HVAC & Refrigeration



General

Tundra Seal EPDM Rubber Pipe Insulation is a flexible, closed-cell and light weight EPDM based elastomeric material designed for insulating liquid cooling and heating lines. The closed-cell structure makes it an efficient insulation. Tundra Seal is manufactured to consistently provide actual values on these key performance criteria for mechanical system insulation:

Thermal Conductivity: 0.25
Water Vapour Transmission: 0.1
Fire Rating: Will not contribute significantly to fire (simulated end-use testing).

Tundra Seal comes in 3/8" and 1/2" thicknesses, has a flame spread rating of 25 or less and smoke developed rating of 50 or less as tested by ASTM E 84 "Surface Burning Characteristics of Building Materials".

Note: Numerical flammability ratings alone may not define the performance under actual fire conditions. They are provided only for use in the selection of products to meet limits specified.

Key Features

- UV Resistant
- Low thermal conductivity
- Easy to install
- 25/50 rated
- Versatile for heating, AC refrigeration and plumbing

Uses

Tundra Seal is used to retard heat gain and control condensation drip from cold-water plumbing, chilled water and refrigeration lines. It also efficiently reduces heat flow for hot water plumbing, liquid heating and dual temperature piping. Tundra Seal's recommended temperature usage range is -70°F to + 257°F.

Resistance to Moisture Vapour Flow

The closed-cell structure of Tundra Seal effectively retards the flow of moisture vapour, and is considered a low transmittance vapour retarder. It requires no supplemental vapour retarder protection.

Application

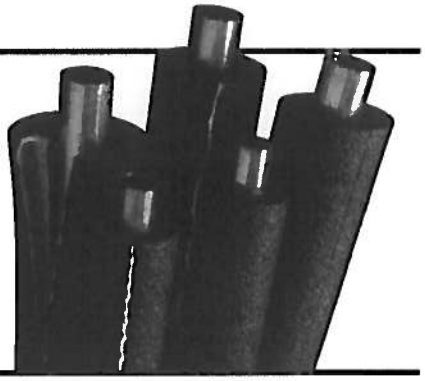
Tundra Seal utilizes a unique 2-step sealing system to insure a permanent seal. Step 1 is an acrylic adhesive seam seal. Step 2 is an EPDM flap that utilizes a cellular fusion adhesive. This adhesive chemistry bonds the EPDM to the tube ensuring a seal for the life of the system.

The closed-cell structure of Tundra Seal retards heat gain on low temperature applications and prevents heat loss on hot water applications. It resists moisture and vapour without the use of an additional barrier. It has a low and stable thermal conductivity. The raw material used for Tundra Seal has an excellent ultraviolet and weather resistance property.

Specifications

Physical Properties	TUNDRA	Test Method
Cell Structure	Closed Cell	—
Density Lbs/ft³	3 to 6 Lbs/ft³	ASTM D 1687
Thermal Conductivity BTU.IN/FT.²HR.°F Mean temp. K-Value	-40°F (-20°C) 0.22 32°F (0°C) 0.23 75°F (24°C) 0.25 90°F (32°C) 0.26	104°F (40°C) 0.27JIS ASTM C177 A 1412
Service Temp	-70°F to 257°F -57°C to +125°C	AEROCEL becomes hard at -57°C but can be used even at -200°C
UV Weather Resistance	Excellent	ASTM G-23
Ozone Resistance	No Cracking	ASTM D 1171
Water Vapour Permeability	0.10 perm-in (0.15 x 10^{-12})	ASTM C355
Water Absorption (weight%)	0.2%	ASTM C 209
Flammability	Class V 0	UL-94
Smoke Density	25/50	ASTM E84
	Self Extinguishing	ASTM D635
Corrosion of copper, stainless	Non corrosive	DIN1988
Nitrosamine Contents	Not detected	U.S. FDA
Flexibility	Excellent	—

Polyethylene Pipe Insulation



General

Tundra Brand Polyethylene Pipe Insulation is a flexible and easy-to-apply tubing product available in Semi-Slit and Self-Sealing styles. It is packaged in cartons that feature the copper tube sizes in bold colour-coded print. The Self-Sealing version has yellow self-seal release liner that is both easy to see and peel.

Tundra Brand Polyethylene Pipe Insulation is sold in all the common sizes required for home plumbing systems, including special fittings for tees and 90° elbows. This chemically inert pipe insulation has a closed-cell structure that allows it to function as an efficient insulator.

Key Features

- Low density
- Easy-to-apply
- Available in Self-Seal or Semi-Slit
- Best for indoor applications such as plumbing, hot water heater lines or in-floor radiant heat
- Best applications where temperature does not exceed 82°C or below -68°C
- Reduces Heat Loss
- Resists Freezing
- Reduces Condensation
- Reduces Plumbing Noise

Uses

Tundra Brand Polyethylene Pipe Insulation is widely used to reduce unwanted heat loss or heat gain, decrease plumbing noise and maximize energy savings. It can be used on hot and cold water lines, refrigeration lines, air conditioning lines and underground lines. This product boasts a broad range of other insulating applications and can be used as a protective cover where necessary.

Tundra Brand Polyethylene Pipe Insulation meets all specifications for both home and industrial applications where the operating temperature is between -90°F and 180°F (-68°C and 82°C).

Tundra Brand Polyethylene Pipe Insulation has a flame spread rating of 25 or less and a smoke developed rating of 50 or less, as tested by ASTM E 84 "Surface Burning Characteristics of Building Materials."

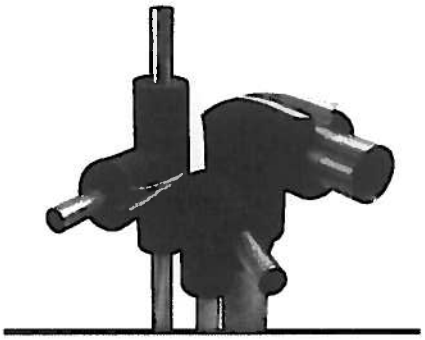
Note: Numerical flammability ratings alone may not define the performance under actual fire conditions. They are provided only for use in the selection of products to ensure the specified limits are met.

Available in 3 and 6 foot lengths. 3' available in bulk or bagged 4 sticks.

All sizes available in 3/8" and 5/8" wide thickness.

Specifications

Physical Properties	TUNDRA	Test Method
Material	Closed Cell Polyolefin	—
Colour	Charcoal	—
Upper Use Limit	180° F (82° C) constant	—
Lower Use Limit	-90° F (-68° C)	—
Density	1.5 lbs/ft³	ASTM D 1622
Ozone Resistance	Good	ASTM D 1171
Thermal Conductivity (K)	at 75° F (24° C) Mean Temp	ASTM C 177 or C 518
BTU-in/hr-ft² -°F (W/m-K)	0.230 (0.033)	—
Water Absorption	0.02% by Volume	ASTM E 96
Flame Speed	Less than 25	ASTM E 84; CAN/ ULC-S102.2-M88
Smoke Classification	Less than 50	ASTM E 84; CAN/ ULC-S102.2-M88



T's and Elbows are available in all sizes.

Tundra Seal Fittings

Note: Self-seal. Colour Coded Packaging. Inches Shown)

Part Number	Nominal ID size	Copper Pipe Nom. ID	Iron Pipe/ PVC Nom. ID	Buy Pack
SEAL FITTINGS (SELF-SEAL)/TEE'S IN SHELF PACK CARTONS (CTN: 14.5" X 7.25" X 6.5") - (3/8" WALL)				
PF38058T5TU0	5/8" ID	1/2"	N/A	16
PF38078T5TU0	7/8" ID	3/4"	3/8"	12
PF38118T5TU0	1-1/8" ID	1"	1/2"	12
PF38138T5TU0	1-3/8" ID	1-1/4"	3/4"	8
ELBOW'S IN SHELF PACK CARTONS (CTN: 14.5" X 7.25" X 6.5") - (3/8" WALL)				
PF38058T2TU0	5/8" ID	1/2"	N/A	32
PF38078T2TU0	7/8" ID	3/4"	3/8"	20
PF38118T2TU0	1-1/8" ID	1"	1/2"	16
PF38138T2TU0	1-3/8" ID	1-1/4"	3/4"	12

Tundra (Semi-Slit)

Note: Semi-slit. Colour Coded Packaging. Inches Shown)

Part Number	Nominal ID size	Copper Pipe Nom. ID	Iron Pipe/ PVC Nom. ID	Buy Pack
3-FT BAGS OF 4 (UNTAPED - SEMI-SLIT) (3/8" WALL)				
PR38058UATU0	5/8" ID	1/2"	3/8"	24
PR38078UATU0	7/8" ID	3/4"	1/2"	18
PR38118UATU0	1-1/8" ID	1"	3/4"	14
PR38138UATU0	1-3/8" ID	1-1/4"	1"	10
3-FT BAGS OF 4 (UNTAPED - SEMI-SLIT) (5/8" WALL)				
PR58058UATU0	5/8" ID	1/2"	3/8"	16
PR58078UATU0	7/8" ID	3/4"	1/2"	12
PR58118UATU0	1-1/8" ID	1"	3/4"	10
PR58138UATU0	1-3/8" ID	1-1/4"	1"	7
3-FT BULK (UNTAPED - SEMI-SLIT) (3/8" WALL)				
PR38058UMTU0	5/8" ID	1/2"	3/8"	100
PR38078UMTU0	7/8" ID	3/4"	1/2"	75
PR38118UMTU0	1-1/8" ID	1"	3/4"	55
PR38138UMTU0	1-3/8" ID	1-1/4"	1"	45
3-FT BULK (UNTAPED - SEMI-SLIT) (5/8" WALL)				
PR58058UMTU0	5/8" ID	1/2"	3/8"	64
PR58078UMTU0	7/8" ID	3/4"	1/2"	52
PR58118UMTU0	1-1/8" ID	1"	3/4"	40
6-FT BULK (UNTAPED - SEMI-SLIT) (3/8" WALL)				
PR38058UWTU0	5/8" ID	1/2"	3/8"	70
PR38078UWTU0	7/8" ID	3/4"	1/2"	50
PR38118UWTU0	1-1/8" ID	1"	3/4"	40
PR38138UWTU0	1-3/8" ID	1-1/4"	1"	32
6-FT BULK (UNTAPED - SEMI-SLIT) (5/8" WALL)				
PR58058UWTU0	5/8" ID	1/2"	3/8"	40
PR58078UWTU0	7/8" ID	3/4"	1/2"	35
PR58118UWTU0	1-1/8" ID	1"	3/4"	25
PR58138UWTU0	1-3/8" ID	1-1/4"	1"	20

Tundra Seal (Self-Seal)

Note: Self-seal. Colour Coded Packaging. Inches Shown)

Part Number	Nominal ID size	Copper Pipe Nom. ID	Iron Pipe/ PVC Nom. ID	Buy Pack
3-FT BAGS OF 4 (SELF-SEAL) (3/8" WALL)				
PR38058TATU0	5/8" ID	1/2"	3/8"	24
PR38078TATU0	7/8" ID	3/4"	1/2"	18
PR38118TATU0	1-1/8" ID	1"	3/4"	14
PR38138TATU0	1-3/8" ID	1-1/4"	1"	10
3-FT BAGS OF 4 (SELF-SEAL) (5/8" WALL)				
PR58058TATU0	5/8" ID	1/2"	3/8"	16
PR58078TATU1	7/8" ID	3/4"	1/2"	12
PR58118TATU0	1-1/8" ID	1"	3/4"	10
PR58138TATU0	1-3/8" ID	1-1/4"	1"	7
3-FT BULK (SELF-SEAL) (3/8" WALL)				
PR38058TMTU0	5/8" ID	1/2"	3/8"	100
PR38078TMTU0	7/8" ID	3/4"	1/2"	75
PR38118TMTU0	1-1/8" ID	1"	3/4"	55
6-FT BULK (SELF-SEAL) (3/8" WALL)				
PR38058TWTU0	5/8" ID	1/2"	3/8"	70
PR38078TWTU0	7/8" ID	3/4"	1/2"	50
PR38118TWTU0	1-1/8" ID	1"	3/4"	40
PR38138TWTU0	1-3/8" ID	1-1/4"	1"	32
6-FT BULK (SELF-SEAL) (5/8" WALL)				
PR58058TWTU0	5/8" ID	1/2"	3/8"	40
PR58078TWTU0	7/8" ID	3/4"	1/2"	35
PR58118TWTU0	1-1/8" ID	1"	3/4"	25
PR58138TWTU0	1-3/8" ID	1-1/4"	1"	20

Tundra Foam products come in easy-to-identify retail packaging.

Industrial Thermo Polymers Limited
153 Van Kirk Drive, Brampton, Ontario L7A 1A4
Tel: 905.846.3666 Fax: 905.846.0363 Toll Free: 1.800.387.3847
Email: info@tundrafoam.com Web: www.tundrafoam.com

IMCOLOCK® Self-Seal Tube

TECHNICAL DATA

Physical Properties		IMCOLOCK® Insulation	Test Methods
Thermal Conductivity (K)	90°F (32°C) Mean Temp	.255 (.037)	ASTM C 177/C 518
BTU -in/hr - Ft² - °F (W/mK)	75°F (24°C) Mean Temp	.250 (.036)	ASTM C 177/C 518
	50°F (10°C) Mean Temp	.245 (.035)	ASTM C 177/C 518
Operating Temperature Range:	Upper	210°F (99°C)	
Flexible to -100°F (-73°C)	Lower	-330°F (-201°C)	
Water Vapor Permeability Dry Cup, Perm-in		0.07	ASTM E96
Ozone Resistance		Pass	ASTM D 1171
Chemical/Solvent Resistance		Good	
Mildew Resistance/Air Erosion		Pass	UL 181

Thickness Recommendations* - To Control Condensation

Pipe Size	Line Temp 50°F	10°C	Line Temp 35°F	2°C	Line Temp 0°F	-18°C	Line Temp -20°F	-29°C
Normal Conditions (Max 85°F, 29°C, 70% RH)								
3/8" I.D. thru 1-3/8"	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	1"	25 mm
Over 1-3/8" thru 3-1/8"	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 3-1/8" thru 4-1/2"*	3/8"	10 mm	1/2"	13 mm	1"	25 mm	1"	25 mm
Over 4-1/2"	1/2"	13 mm	3/4"	19 mm	1"	25 mm	1-1/4"	32 mm
Mild Conditions (Max 80°F, 26°C, 60% RH)								
3/8" I.D. thru 2-1/8"	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 2-1/8" thru 3-1/8"	3/8"	10 mm	3/8"	10 mm	1/2"	13 mm	1/2"	13 mm
Over 3-1/8" thru 4-1/2"*	3/8"	10 mm	3/8"	10 mm	3/4"	19 mm	3/4"	19 mm
Over 4-1/2"	3/8"	10 mm	1/2"	13 mm	3/4"	19 mm	3/4"	19 mm
Severe Conditions (Max 90°F, 32°C, 80% RH)								
3/8" I.D. thru 1-1/8" I.D.	3/4"	19 mm	3/4"	19 mm	1-1/4"	32 mm	1-1/4"	32 mm
Over 1-1/8" I.D. thru 4-1/2"	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	1-1/2"	38 mm
Over 4-1/2"	3/4"	19 mm	1"	25 mm	1-1/2"	38 mm	2"	50 mm

IMCOLOCK® in thickness noted within the specified temperature ranges will prevent condensation on indoor piping under design conditions defined below.
Thickness recommendations above 1" can be sleeved to achieve thickness desired.
Normal: Maximum severity of indoor conditions seldom exceed 85°F and 70% R.H. in United States.
Mild: Typical conditions are most air-conditioned spaces and arid climates.
Severe: Generally found in areas where excessive moisture is introduced or in poorly ventilated areas where the temperature may be depressed below the ambient.
Under conditions of high humidity, additional thickness of insulation may be required.
*Available: Nom. 1/2" or Nom. 3/4" thickness only.

IMCOLOCK® "R" Values

Pipe O.D. or Nominal Insulation I.D.		R Value 3/8" (10 mm) Wall	R Value 1/2" (13 mm) Wall	R Value 3/4" (19 mm) Wall	R Value 1" (25 mm) Wall
3/8"	10 mm	3.1	4.2	6.6	9.3
1/2"	13 mm	2.8	3.7	6.0	8.6
5/8"	16 mm	2.8	3.5	5.6	7.9
3/4"	19 mm	2.6	3.4	5.4	7.6
7/8"	22 mm	2.5	3.3	5.2	7.2
1-1/8"	29 mm	2.4	3.1	4.8	6.8
1-3/8"	35 mm	2.3	3.2	4.8	6.8
1-5/8"	41 mm	2.3	2.9	4.5	6.2
2"	50 mm	2.0	2.6	4.1	5.7
2-1/8"	54 mm	2.0	2.6	4.0	5.6
2-1/4"	57 mm	2.0	2.6	4.0	5.6
2-3/8"	60 mm	2.0	2.6	4.2	5.7
2-7/8"	72 mm	2.0	2.5	3.9	5.3
3-1/8"	79 mm	2.3	2.8	4.1	5.5
3-1/2"	89 mm	2.0	2.5	3.7	5.1
3-5/8"	92 mm	2.0	2.5	3.6	5.0
3-7/8"	98 mm	2.0	2.6	3.8	5.2
4-1/2"	114 mm	1.9	2.5	3.6	5.0

Note: "R" factors were calculated using a K factor of .250 (75° F, 24° C mean temp.) and nominal wall thickness in each case.
Lower operating temperatures will result in improved R values. Contact Technical Services for specific recommendations.

OMACO Insulation
3006 Anaconda Road | Tarboro, NC 27886 | p 866-875-2584 | f 866-876-2688
www.omacoinsulation.com

Made in USA

NI-2012-05-07-12

NAIMA 3EPlus V4.1

Item ID = 1
Item Description =
System Application = Pipe - Horizontal
Dimensional Standard = ASTM C 585 Rigid
Calculation Type = Heat Loss Per Hour Report
Process Temperature = 110
Ambient Temperature = 72
Wind Speed = 0.0

Nominal Pipe Size = 0.5
Bare Metal = PVC
Bare Surface Emittance = 0.9
Insulation Layer 1 = 850F Mineral Fiber PIPE, Type I, C547-11

Outer Jacket Material = All Service Jacket
Outer Surface Emittance = 0.9

Variable Insulation Thickness	Surface Temp (°F)	Heat Loss (BTU/hr/ft)	Efficiency (%)
Bare	102.3	13.70	
0.5	78.3	4.74	65.39
1.0	75.3	3.45	74.82
1.5	74.1	2.84	79.28
2.0	73.5	2.53	81.54
2.5	73.1	2.22	83.78
3.0	72.9	2.09	84.72
3.5	72.8	1.99	85.47
4.0	72.7	1.91	86.07
4.5	72.6	1.83	86.64
5.0	72.5	1.77	87.06
5.5	72.5	1.72	87.42
6.0	72.4	1.67	87.82
6.5	72.4	1.63	88.09
7.0	72.3	1.60	88.34
7.5	72.3	1.57	88.56
8.0	72.3	1.54	88.77
8.5	72.3	1.51	88.95
9.0	72.3	1.49	89.12
9.5	72.2	1.47	89.28
10.0	72.2	1.45	89.43

NAIMA 3EPlus V4.1

Item ID = 1
Item Description =
System Application = Pipe - Horizontal
Dimensional Standard = ASTM C 585 Rigid
Calculation Type = Heat Loss Per Hour Report
Process Temperature = 48
Ambient Temperature = 72
Wind Speed = 0.0

Nominal Pipe Size = 0.5
Bare Metal = PVC
Bare Surface Emittance = 0.9
Insulation Layer 1 = 850F Mineral Fiber PIPE, Type I, C547-11

Outer Jacket Material = All Service Jacket
Outer Surface Emittance = 0.9

Variable Insulation Thickness	Surface Temp (°F)	Heat Gain (BTU/hr/ft)	Efficiency (%)
Bare	52.4	7.88	
0.5	68.0	2.82	64.25
1.0	69.9	2.05	73.93
1.5	70.7	1.69	78.53
2.0	71.0	1.51	80.87
2.5	71.3	1.32	83.20
3.0	71.5	1.25	84.17
3.5	71.5	1.19	84.94
4.0	71.6	1.14	85.57
4.5	71.7	1.09	86.15
5.0	71.7	1.06	86.59
5.5	71.7	1.03	86.97
6.0	71.8	0.99	87.38
6.5	71.8	0.97	87.67
7.0	71.8	0.95	87.92
7.5	71.8	0.93	88.15
8.0	71.8	0.92	88.36
8.5	71.8	0.90	88.56
9.0	71.8	0.89	88.73
9.5	71.8	0.87	88.90
10.0	71.9	0.86	89.05