



94 Reservoir Park Drive
Rockland, MA 02370
(617)-544-3200

January 31, 2024

**Solution: Mechanical Insulation Upgrade
Boiler Room #2**

Site: Somerville DPW, 17 Franey Rd., Somerville, MA 02145

Presented To:
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City of Somerville
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Prepared By:
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Inovis Energy, Inc, is a turn-key implementer of energy efficiency measures. We provide our clients with a streamlined approach to energy conservation projects that makes the process efficient, clear, and successful

We have included the necessary information for review of the above-mentioned project in this report. We hope you find our analysis clear and concise. If there are any specific questions, or additional information requested, please let us know.

Tony Parente

Tony Parente
Director of
Business
Development
Inovis Energy, Inc.

Proposed Scope of Work:

Currently there is a significant energy loss identified through feet of steam piping in Boiler Room #2.

A general description of work is as follows:

- **Insulate 243' of existing Steam pipe with 1-1/2" & 2" thick fiberglass preformed pipe insulation with ASJ 39 fittings to be insulated and covered with a one-piece PVC fitting cover.**
- **Insulate 55' of existing domestic hot water pipe with 1" thick fiberglass preformed pipe insulation with ASJ 6 fittings to be insulated and covered with a one-piece PVC fitting cover.**
- **All materials will be installed and sealed per manufacturers recommendations.**
- **Exclusions & Exceptions: Permits, labels, painting, firestopping.**

All materials will be installed and sealed per manufacturers recommendations.

Clarifications, Omissions, and Assumptions:

1. **Work to be performed during normal, first shift hours (6a-4p), Monday-Friday, non-prevailing wage.**
2. **No existing code violations to be corrected.**
3. **Inovis will insulate pipes that are reachable within reasonable limits of a 10' ladder or lift access. Pipes on the underside of hot water tanks are excluded due to access.**
4. **This proposal excludes product/process pipe, permits, labels, painting, firestopping.**

Financials:

Description	Total Cost	Estimated Incentive	Net Cost	Annual Therm Savings	Annual Cost Savings	Payback (yrs)
Supply & Install pipe & fitting insulation	\$17,800	\$2,700	\$15,100	1,800	\$2,250	6.7

*Incentives based on custom incentive rate \$1.50/therm

*Cost savings based on a fuel cost of \$1.25/therm

SPECIFICATIONS

GLT Tempmat is non-corrosive, non-combustible, non-alkaline and chemically stable. Its excellent heat resistance, flexibility and low thermal conductivity make Tempmat an effective low-cost replacement for asbestos mats, millboard refractory paper and other similar products.

The transition from asbestos to glass fibers has resulted in an increasingly wide range of application for Tempmat, rather than organically bonded glass fiber insulating blanket. A 100% "E" fiberglass mat, Tempmat is manufactured in web form and mechanically needled together to form thicknesses of ¼", ½" and 1". There are no binders in Tempmat. Instead, long textile fibers have been accurately chopped to provide maximum density, high insulation and strong physical properties in temperatures up to 1200°F.



GLT Tempmat meets the following requirements of commercial and government specifications:

MIL-1-24244	Compliance with government specifications
MIL-1-16411, Type II	U.S. Coast Guard incombustible materials, USCG 164-009

GLT Tempmat is being used to solve increasingly complex applications in oil refineries, steam and gas turbines, exhaust systems on diesel tug, tankers, Coast Guard and Navy vessels, and pleasure yachts. It is used to relieve stress at welding points and on valve flange covers. In addition, Tempmat acts as an insulator over automotive thermactor switches, for floor pans over catalytic converters and in luggage compartments. In nuclear power plants, these blankets reduce labor costs during removal for inspection and service, and cut re-insulation costs associated with poor fitting rigid block.

Physical Properties of GLT Tempmat

	Thickness (in.)	Mass (density lbs./cu. ft.)	Width (in.)	Roll Length (ft.)	Surface Area (sq. ft./roll)	Approx. Roll Weight (net lbs.)
Style #1006	¼"	9 to 11	60	150	750	188
Style #1050	½"	9 to 11	60	75	375	188
Style #1031	1"	9 to 11	60	45	225	225

Note: Width and roll length can be made to order. All values above are nominal values.

Acoustical Performance

Thickness (in.)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
¼"	.05	.10	.20	.45	.75	.85	.30
½"	.05	.10	.35	.75	.95	.90	.35
1"	.10	.30	.85	1.00	1.00	1.00	.60



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Pipe and Tank Wraps

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Pipe and Tank Insulation wraps, also referred to as Lamella tank wraps are used extensively in industrial insulation applications to insulate horizontal/vertical tanks and vessels. GLT Products has a number of insulation options available to meet the needs of the industrial market no matter what the application. Our line of Pipe and Tank insulation wraps allow for the insulation of curved surfaces such as large pipes, cylindrical vessels, ducts, tanks and other round surfaces.

GLT Products offers both [Fiberglass](#) and [Mineral Wool](#) Pipe and Tank Insulation in FSK and ASJ facings manufactured in our own facilities. This insulation is designed for piping over 8" IPS and curved surfaces. [Fiberglass](#) is used to insulate cold and hot surfaces from -60°F to 650°F. [Mineral Wool](#) is generally used to insulate hot surfaces up to 1000°F.

Additionally, we stock mineral wool boards from Rockwool such as ProRox SL 930 and Enerwrap® MA 960 for the insulation of tank walls. Our Radial Wrap™ line is also available and is suitable for both hot and cold applications. Radial Wrap is available in 48" Widths and 1.5" and 2" thicknesses.



[Fiberglass Pipe & Tank Insulation](#)

GLT Products Fiberglass Pipe & Tank Wrap is fabricated from a semi rigid fiberglass with segmented sections designed to insulate large piping (over 8" IPS) and curved surfaces.



[Mineral Wool Pipe & Tank Insulation](#)

Mineral Wool Pipe and Tank Insulation is a semi-rigid, mineral wool designed to insulate large piping (over 8" IPS), and other curved surfaces. It is made with the fibers perpendicular to the surface and comes with a variety of jacketing. GLT Products mineral wool jacketing is also available with an ASJ or FSK facing.



[Radial Wrap Rolled Fiberglass Insulation](#)

Radial Wrap™ rolled fiberglass insulation is a flexible rolled fiberglass insulation product that allows for installation on round surfaces in either hot or cold applications.



[Enerwrap® MA 960](#)

ENERWRAP® MA 960 from ROCKWOOL is a rolled and faced mineral wool (Stone Wool) insulation wrap/mat. It is designed for high-temperature industrial applications where flexibility is often desired. The product is ideal for large diameter piping, vessels, ducts and equipment subject to light mechanical loads.

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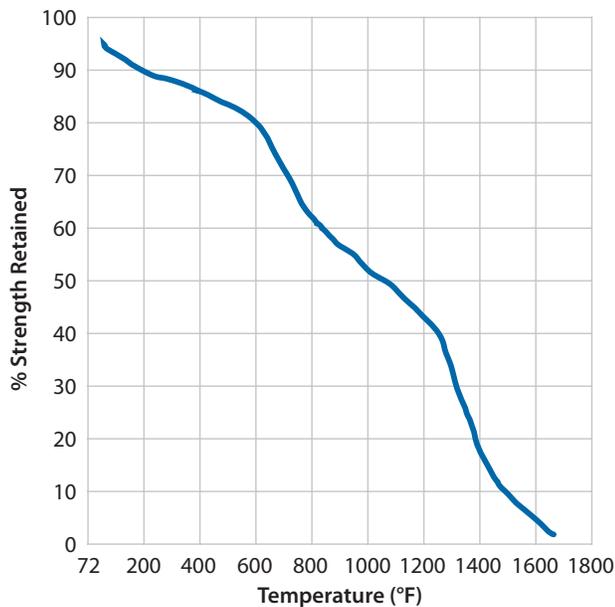
Physical Properties

Service Temperature..... Up to 1200°F
 Fire ResistanceIncombustible
 Density (Approximate).....9 - 11 lbs./cu. ft.
 Moisture Absorption.....Negligible

Thermal Conductivity (“K” value at 9.1 lbs./cu. ft.):

Mean Temperature	“K”-btu/sq. ft./hr./°F/in.
300°F	0.40
500°F	0.50
700°F	0.65

Glass Filament Tensiles (at various temperatures)



Properties of Fiberglass “E” Glass

Physical/Mechanical Properties of Glass Fibers

Specific Gravity.....2.60 grams/cc.
 Density 0.094 lbs./cu. in.
 Tensile Strength (PSI×10³ @ 70°F).....500 lbs.
 Modulus of Elasticity (PSI×10 @ 72°F)..... 10.5 lbs.
 After Heating (PSI×10 @ 1000°F)..... 11.8 lbs.
 Elongation (@ 72°F)..... 4.8%

Thermal Properties of Bulk Glass

Softening Point..... 1500°F
 Strain Point.....1100°F
 Annealing Point 1200°F

Electrical Properties of Bulk Glass

Dielectric Constant
 1 MHz @ 72°F.....6.33
 10kHz @ 72°F..... 6.13
 Power Factor
 1MHz @ 72°F0.001
 10kHz @ 72°F.....0.0039

Note: The physical and performance properties cited in this literature have been derived in tests conducted by various fiber companies.

Tests have been conducted on both fiber and fabrics woven with bulked glass fiber.

Reference to U.S. Government specification values as well as information provided on certain end uses which currently use bulked glass are presented for the information of potential customers in determining the potential suitability of these products for their own applications. No claims are made as to the accuracy or applicability of the test methods employed or the results derived therefrom.

Important Cautionary Note: Items of protective equipment manufactured from fiberglass fabrics such as aprons, gloves, mittens, etc. should be labeled to show the maximum short-term and continuous-exposure temperature limits established in accordance with the standard specifications applicable to the item of equipment being offered.

For more information on GLT Products, please call toll-free at 800.874.1748 or visit us online at www.gltproducts.com.



HEADQUARTERS:

6810 Cochran Road | Solon OH 44139 | 440.914.1122 | 440.914.1133 Fax | **1.800.874.1748**

DISTRIBUTION CENTERS:

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Fiberglass Pipe Insulation

Approved Vendor Pipe Fitting

Insulation—Preformed fiberglass insulation for 90° elbows and tees eases installation and provides for greater thermal performance. Includes matching PVC cover. Installs with 1" Pipe Fitting Insulation Tape 6WXE4, sold separately. Use 3" Pipe Insulation Tape 4LFJ3 to seal butt joints. Insulation meets ASTM C547 and C300 Series.

- Application temp. range: 0° to 450°F
- White color

Owens Corning Fiberglass Pipe

Insulation—The pressure sensitive adhesive system features a self-sealing flap to ease installation. GREENGUARD Certified.

- 3-ft. lengths
- Service temp. range: 0° to 1000°F
- White color jacket

Owens Corning ASJ Max Fiberglass Pipe

Insulation—Cleanable, encapsulated paper jacket doesn't support mildew or mold growth. Jacket resists moisture during intermittent, short duration precipitation exposure during installation (with joints sealed per installation guidelines). SSL Max closure system provides a tight, reliable seal without glue or staples. Certified by SCS Global Services to contain a minimum of 53% recycled glass content, 31% pre-consumer and 22% post-consumer. GREENGUARD Gold Certified. Meets UL 723, ASTM E84, and CAN/ULC S-102, ASTM C547, and ASTM C1136, Types I – IV.

- 3-ft. lengths
- Service temp. range: 0° to 1000°F (with heat-up schedule)
- White color

Owens Corning 3"-Wide Pipe Insulation

Tape—Seals end joints and completes the closure systems.

- Service temp. range: 25° to 110°F (ambient)
- Service temp. range: -20° to 150°F
- White color jacket



4LFC9

4LFJ3

MINIMUM QUANTITY OF 3" WIDE ASJ TAPE ROLLS REQUIRED		
Iron Pipe or Copper Tube Size (in.)	No. of Sections per 25-ft. Roll	No. of Sections per 150-ft. Roll
1/2 to 1 1/2	up to 10	up to 60
1 1/2 to 3 1/2	up to 8	up to 48
4 to 6	up to 5	up to 30

Example: 15 sections of 1.0" nominal pipe size would require two 25-ft. rolls of tape.

Insulation Nominal I.D.	Copper Tube Size (Nom. Plumbing I.D.)	Copper Tube Size (HVAC/R) (O.D.)	90° Elbow Wall Thickness - Insulation			Tee Wall Thickness - Insulation		
			1" Item No.	1 1/2" Item No.	2" Item No.	1" Item No.	1 1/2" Item No.	2" Item No.
Approved Vendor—Pipe Fitting Insulation								
1/2"	—	—	6WYC7	6MPW7	6MPX7	6MRC3	6MRD3	6MRE3
3/4"	—	—	6MPY7	6MPZ6	—	6MRF3	6MRG2	—
1"	—	—	6WYC8	6MPW8	6MPX8	6MRC4	6MRD4	6MRE4
1 1/4"	—	—	6MPY8	6MPZ7	6MRA5	6MRF4	6MRG3	6MRH1
1 1/2"	—	—	6WYC9	6MPW9	6MPX9	6MRC5	6MRD5	6MRE5
1 3/4"	—	—	6MPY9	6MPZ8	6MRA6	6MRF5	6MRG4	6MRH2
2"	—	—	6WYD0	6MPX0	6MPY0	6MRC6	6MRD6	6MRE6
2 1/4"	—	—	6MPZ0	6MPZ9	6MRA7	6MRF6	6MRG5	6MRH3
2 1/2"	—	—	6WYD1	6MPX1	6MPY1	6MRC7	6MRD7	6MRE7
2 3/4"	—	—	6MPZ1	6MRA0	6MRA8	6MRF7	6MRG6	6MRH4
3"	—	—	6WYD2	6MPX2	6MPY2	6MRC8	6MRD8	6MRE8
3 1/4"	—	—	6MPZ2	6MRA1	6MRA9	6MRF8	6MRG7	6MRH5
3 1/2"	—	—	6WYD3	6MPX3	6MPY3	6MRC9	6MRD9	6MRE9
3 3/4"	—	—	6MPZ3	6MRA2	6MRC0	6MRF9	6MRG8	6MRH6
4"	—	—	6WYD4	6MPX4	6MPY4	6MRD0	6MRE0	6MRF0
4 1/4"	—	—	6MPZ4	6MRA3	6MRC1	6MRG0	6MRG9	6MRH7
4 1/2"	—	—	6WYD5	6MPX5	6MPY5	6MRD1	6MRE1	6MRF1
4 3/4"	—	—	6MPZ5	6MRA4	6MRC2	6MRF0	6MRH0	6WXC3
5"	—	—	6MPW6	6MPX6	6MPY6	6MRD2	6MRE2	6MRF2

Fits Pipe Size - Pipe Insulation	Fits Tube Size	Insulation Nominal I.D.	1/2 in Item No.	1 in Item No.	1 1/2 in Item No.	2 in Item No.
Owens Corning—Fiberglass Pipe Insulation						
3/4"	1 1/8"	1 3/8"	40PP22	—	—	—
1"	1 3/8"	1 5/8"	40PP32	—	—	—
1 1/4"	1 5/8"	1 7/8"	40PP33	—	—	—
1 1/2"	2 1/8"	2 3/8"	40PP18	—	—	—
3"	3 3/8"	3 7/8"	—	—	—	40PP20
Owens Corning—ASJ MAX Fiberglass Pipe Insulation						
3/8"	3/8"	3/8"	—	4LFG6	4LFH2	—
1/2"	1/2"	1/2"	—	4LFC9	4LFE2	4LFF4
3/4"	3/4"	3/4"	—	4LFD1	4LFE3	4LFF5
1"	1"	1"	—	4LFD2	4LFE4	4LFF6
1 1/4"	1 1/4"	1 1/4"	—	4LFD3	4LFE5	4LFF7
1 1/2"	1 1/2"	1 1/2"	—	4LFD4	4LFE6	4LFF8
1 3/4"	1 3/4"	1 3/4"	—	4LFG7	4LFH3	4LFH7
2"	2"	2"	—	4LFD5	4LFE7	4LFF9
2 1/4"	2 1/4"	2 1/4"	—	4LFG8	4LFH4	4LFH8
2 1/2"	2 1/2"	2 1/2"	—	4LFD6	4LFE8	4LFG1
—	3 1/8"	3 1/8"	—	4LFG9	4LFH5	4LFH9
—	3"	3"	—	4LFD7	4LFE9	—
—	4 1/8"	4 1/8"	—	4LFH1	4LFH6	4LFJ1
—	4"	4"	—	4LFD8	4LFE1	4LFG3
—	5"	5"	—	4LFD9	4LFE2	4LFG4
—	6"	6"	—	4LFE1	4LFE3	4LFG5
—	10"	10"	—	—	4LFG2	—
Description			Temp. Range		Item No.	
Owens Corning—3"-Wide Pipe Insulation Tape			0 to 150°F		4LFJ3	
3" x 150-ft. Roll						

Fiberglass Pipe Insulated Fitting Covers and Insulated Jacketing



- White color

Easily fit around pipe to create a protective barrier. Suitable for indoor or outdoor use on chilled water, hot water, steam and other piping systems in commercial, industrial, and institutional applications. Insulated Fitting Covers, when combined with Insulated Jacketing and PVC solvent cement (sold on page 2822), can form a sealed system suitable for washdown applications in food, beverage, and pharmaceutical facilities. Comply with ASTM D257, D638, D790, D792, D1784, D3679, E84, E136; USDA, ICBO, SBCCI, and BOCA.

FIBERGLASS INSULATED FITTING COVERS

- Temp. range: -32° to 150°F
 - R-value: 3.5
- Fit over bare pipe elbows; include insert. PVC and fiberglass construction.

PVC INSULATED PIPE JACKET

- 4-ft. lengths
 - Temp. range: -30° to 150°F
- Fits over bare pipes and pipe insulation. PVC construction.



GTEE0



6ZKJ3

Fits Max. O.D.	Approx. R Value	90° Elbow Item No.	End Cap Item No.	Tee Item No.
Fiberglass Insulated Fitting Covers				
1 1/2 in	3.5	6TEE0	6TEF9	6TEC1
2 in		6TEE1	6TEG0	6TEC2
2 1/4 in		6TEE2	6TEG1	6TEC3
2 1/2 in		6TEE3	6TEG2	6TEC4
2 3/4 in		6TEE4	6TEG3	6TEC5
3 in		6TEE5	6TEG4	6TEC6
3 1/4 in		6TEE6	6TEG5	6TEC7
3 1/2 in		6TEE7	6TEG6	6TEC8
4 in		6TEE8	6TEG7	6TEC9
4 1/2 in		6TEE9	6TEG8	6TED0
5 1/2 in		6TEF0	6TEG9	6TED1
5 3/4 in		6TEF1	6TEH0	6TED2
6 1/2 in		6TEF2	6TEH1	6TED3
6 3/4 in		6TEF3	6TEH2	6TED4
7 1/2 in	6TEF4	6TEH3	6TED5	
7 3/4 in	6TEF5	6TEH4	6TED6	
8 3/4 in	6TEF6	6TEH5	6TED7	
9 3/4 in	6TEF7	6TEH6	6TED8	
10 3/4 in	6TEF8	6TEH7	6TED9	

Fits Max. O.D.	Thickness	Item No.
PVC Insulated Pipe Jacket		
2 in	0.02	6TEH8
2 1/2 in		6TEH9
3 in		6ZKJ1
3 1/2 in		6ZKJ2
4 in		6ZKJ3
4 1/2 in		6ZKJ4
5 in		6ZKJ5
5 1/2 in		6ZKJ6
6 in		6ZKJ7
6 1/2 in		6ZKJ8
7 1/2 in		6ZKJ9
8 1/2 in		6ZKK0
9 1/2 in		6ZKK1
10 3/4 in		6ZKK2