

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK



CITY OF PORTLAND

BUILDING PERMIT

This is to certify that PAUL J GRIFFIN

Located At 109 EDWARDS ST

Job ID: 2011-12-2873-HVAC

CBL: 120- D-003-001

has permission to Geo Thermal Heat Pump

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.

A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

**THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD**

Closed

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.



CITY OF PORTLAND, MAINE

Department of Building Inspections

Original Receipt

_____ 12-6-20 11 _____

Received from _____

Location of Work _____ 109 Adams St. _____

Cost of Construction \$ _____ Building Fee: _____

Permit Fee \$ _____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: _____ 270 _____

Building (IL) _____ Plumbing (I5) _____ Electrical (I2) _____ Site Plan (U2) _____

Other _____

CBL: _____ 10-D-3- _____

Check #: _____ CC _____ Total Collected \$ _____ 270 _____

**No work is to be started until permit issued.
Please keep original receipt for your records.**

Taken by: _____ PJ- _____

WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No: 2011-12-2873-HVAC	Date Applied: 12/6/2011	CBL: 120- D-003-001	
Location of Construction: 109 EDWARDS ST	Owner Name: PAUL J GRIFFIN	Owner Address: 109 EDWARDS ST PORTLAND, ME 04102	Phone:
Business Name:	Contractor Name: Evergreen Geothermal LLC	Contractor Address: 6 Thistle LN FALMOUTH ME 04105	Phone: (207) 650-5098
Lessee/Buyer's Name:	Phone:	Permit Type: HVAC - HVAC	Zone: R-3
Past Use: Single family	Proposed Use: Same - Single family – install Geothermal heat pump in the basement	Cost of Work: 21000.00	CEO District:
		Fire Dept: <input type="checkbox"/> Approved <input type="checkbox"/> Denied <input checked="" type="checkbox"/> N/A	Inspection: Use Group: HVAC Type:
Proposed Project Description: Geo Thermal Heat Pump		Pedestrian Activities District (P.A.D.)	
Permit Taken By:		Zoning Approval	

<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building Permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.</p>	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetlands <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan <input type="checkbox"/> Maj <input type="checkbox"/> Min <input type="checkbox"/> MM Date: <u>OK</u> <u>12/9/11</u> <u>ABU</u>	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:	Historic Preservation <input checked="" type="checkbox"/> Not in Dist or Landmark <input type="checkbox"/> Does not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <u>ABU</u>
	CERTIFICATION		

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

R3

2011-12-2873

FILL IN AND SIGN WITH INK



APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT



To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL 120-D-3 Use of Building Residential Date Dec. 6, 2011
 Name and address of owner of appliance Paul Griffin
109 Edwards St - Portland Me.
 Installer's name and address Evergreen Geothermal
6 Thistle Lane Falmouth ME Telephone 207 650-5098

Location of appliance:

- Basement
- Floor
- Attic
- Roof

Type of Fuel:

- Gas
- Oil
- Solid

Appliance Name: Geothermal Heat Pump
 U.L. Approved Yes No

Will appliance be installed in accordance with the manufacture's installation instructions? Yes No

IF NO Explain: _____

The Type of License of Installer:

- Master Plumber # N/A
- Solid Fuel # 3 ton geothermal
- Oil # not with decupolator
- Gas # _____
- Other _____

Type of Chimney:

- Masonry Lined
Factory built N/A
- Metal
Factory Built U.L. Listing # N/A
- Direct Vent
Type N/A UL# _____

Type of Fuel Tank

- Oil
- Gas

Size of Tank

Number of Tanks

Distance from Tank to Center of Flame N/A feet.

Cost of Work: \$ 21,000⁰⁰

Permit Fee: \$ 230

RECEIVED
 DEC - 6 - 2011
 Dept. of Building Inspections
 City of Portland
 Maine

Approved

Fire: _____
 Ele.: _____
 Bldg.: _____

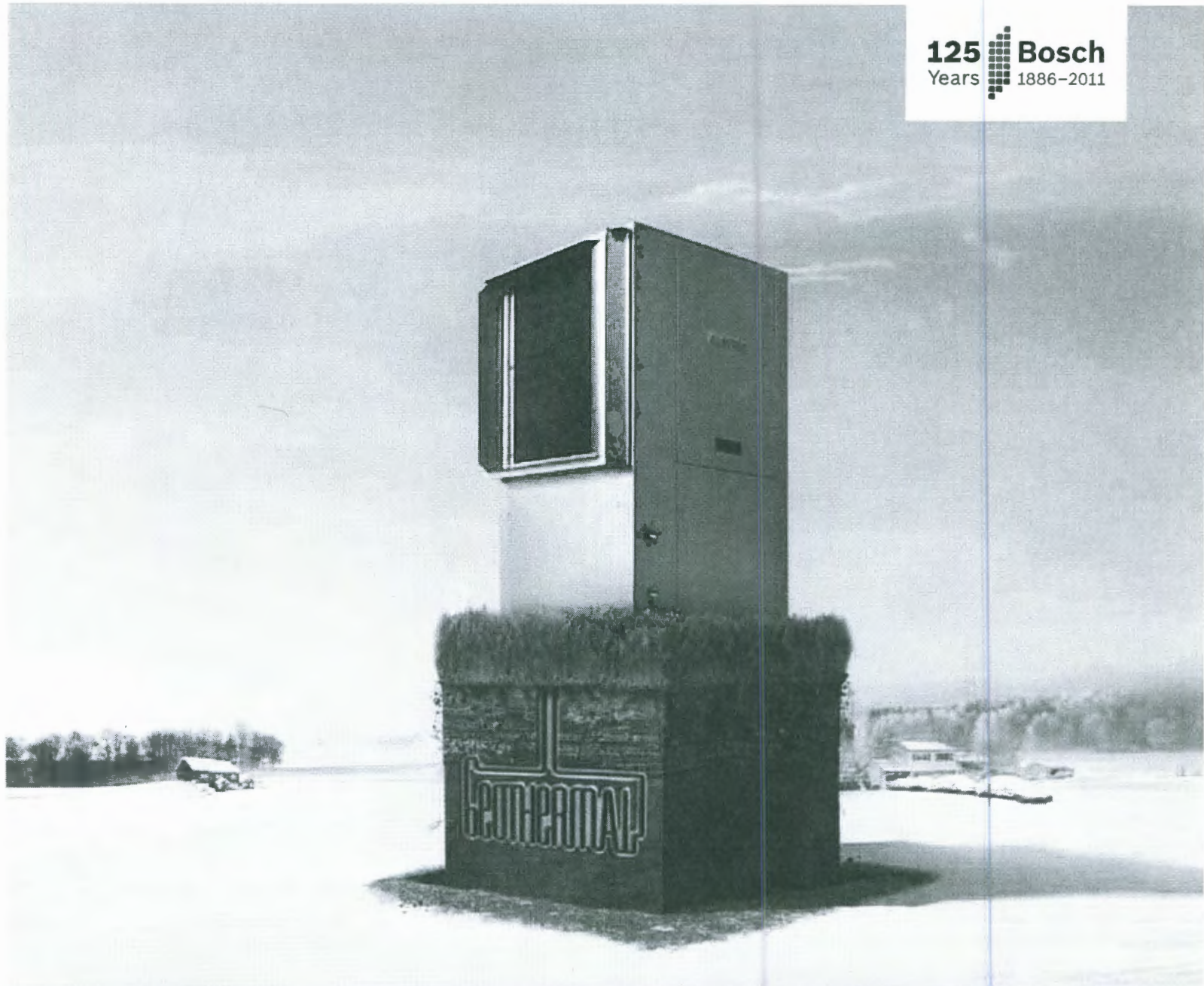
Approved with Conditions

- See attached letter or requirement

Signature of Installer _____

Inspector's Signature _____

Date Approved _____



Residential Geothermal Heat Pumps

Geo 1000 WA

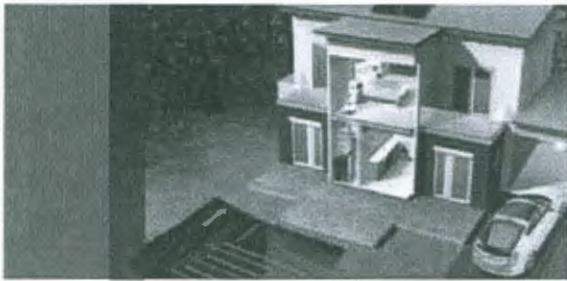
Geothermal Heating & Cooling



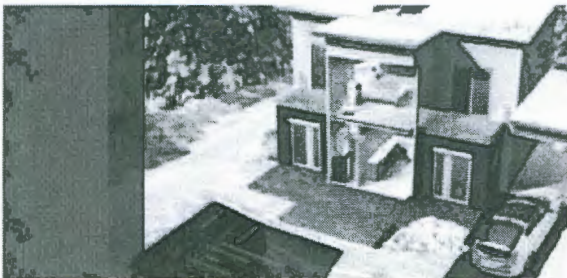
BOSCH
Invented for life

Why Bosch Geothermal Heat Pumps?

Our Geothermal Heat Pump systems are the most energy and cost efficient systems on the market and therefore the greenest technology for heating and cooling. This technology uses the relatively constant temperature of the earth which makes it extremely efficient all year long in virtually any temperature.



Cooling mode



Heating mode

Advantages of Bosch's Geothermal Systems

Environmentally Friendly

Bosch's green technology is the most environmentally friendly way to cool and heat your home. The system has no carbon dioxide emissions or any other negative effects on the environment. Bosch's geothermal installations have the effect of reducing greenhouse gas emissions which are responsible for climate change.

Reliability

Ground loop systems have a life expectancy in excess of 50 years. Your Bosch heat pump is manufactured with rigorous standards ensuring a high efficient operation over the life of the unit. Our residential warranty offer is among the best you will find on the market.

Lower Operating Cost

Bosch's technology helps to save up to 70% on your energy bills for heating, cooling and hot water because of the more efficient operation compared to conventional systems. Simple payback could be as short as 5 to 7 years and you can experience costs savings from the beginning.

About the Bosch Group

The Bosch Group has been a leading global supplier of technology and services in the areas of Automotive, Industrial Technology, Consumer Goods and Building Technology for over 100 years. The company was founded in Stuttgart, Germany in 1886 and today has more than 300 subsidiaries in over 150 countries. Every Bosch product is built with one goal in mind; to enhance quality of life by providing innovative technological solutions. Environmental stewardship inspires and drives Bosch product development. Bosch is a leader in the creation of next-generation technologies that deliver improved performance and efficiency while conserving natural resources.

Bosch Thermotechnology in North America

Bosch Thermotechnology is a leading source of high quality water heating and comfort heating systems. In particular, the company offers Bosch tankless, point-of-use water heaters, Bosch solar thermal systems, Buderus floor-standing and wall-hung boilers, Bosch geothermal heat pumps as well as controls and accessories for every product line. Bosch Thermotechnology is committed to reinventing energy efficiency by offering smart products that work together as integrated systems which enhance quality of life in an ultra-efficient and environmentally friendly manner.

Visit www.125.bosch.com to learn even more about Bosch's past, present and future.

New! BP Bosch Series

Benefits

More Value for your Money

Lowering your monthly utility bills has never been easier with Bosch's Energy Star rated BP Series heat pumps. This single stage geothermal heat pump unit offers best-in-class energy efficiency and lower operating costs, providing you the ultimate value for your money. Compared to other manufacturers' single stage products, you need much less energy on the front end to achieve the output in the heating or cooling mode of operation.



Space Savings

Often installed in closets or above dropped ceilings, these heat pump units offer the best space savings on the market today. Available in ½ through 6 tons, in either vertical or horizontal configurations, the small footprint frees-up valuable living space, making your home a more comfortable place to live.



Quality

The unit features a standard stainless steel drain pan to ensure trouble free condensate removal for the life of the unit. Rigorous factory along with Bosch's 40 years of experience in designing geothermal heat pumps are your assurance of a state of the art quality product. Bosch's ISO 9001-2008 certified facilities provide consistent quality in every unit we build.



Tax Credit for Geothermal Heat Pumps

As of December 1, 2009, home owners who install ENERGY STAR qualified geothermal heat pumps are eligible for a 30% tax credit on the investment in the geothermal system including installation costs. There is no cap on the federal tax credit. New requirements for water-to-air and direct geo-exchange GHP models will take effect on January 1, 2011. Even more stringent levels will go into effect for water-to-water and water-to-air models on January 1, 2012.



30% Tax Credit
Now Available

For more information please visit
www.bosch-climate.us



Key Features





BP New! SERIES

Standard

-  Filter Drier
-  Floating Base Pan
-  Service Connections
-  R410-A Refrigerant
-  PSC and ECM Motors*
-  Coaxial Heat Exchanger Copper
-  Coated Air Coils
-  Blower Housing
-  Unit Protection Module 1
-  Four Sided Filter Rack

-  Foil Faced Insulation
-  Stainless Steel Drain Pan
-  TXV Valve
-  Scroll Compressor**
-  Rotary Compressor**

Optional

-  Coaxial Heat Exchanger Cupronickel
-  Hot Gas Reheat
-  Desuperheater***
-  Geothermal



* BP007 - 012 PSC Motor
BP015 - 070 ECM Motor

** BP024 - 070 Scroll Compressor
BP 007 - 018 Rotary Compressor

*** BP024

For full description of features please visit www.bosch-climate.us, where you will also find helpful tools like our savings calculators and learn more about the most efficient technology for heating and cooling your home.

Financing Information

The smarter way to heat and cool your home is more affordable than ever thanks to special financing options. Qualified homeowners can choose from a variety of loans with a low fixed rate or established fixed monthly rates towards the installation and purchase of Bosch Geothermal Heat Pumps. Depending on model and installation costs, homeowners may be able to borrow as little as \$2,500 or up-to \$20,000 with a 10-year repayment window. A Bosch approved contractor must perform the installation in order to be eligible for the financing. For a complete listing of Bosch installers in your area, log onto www.bosch-climate.us

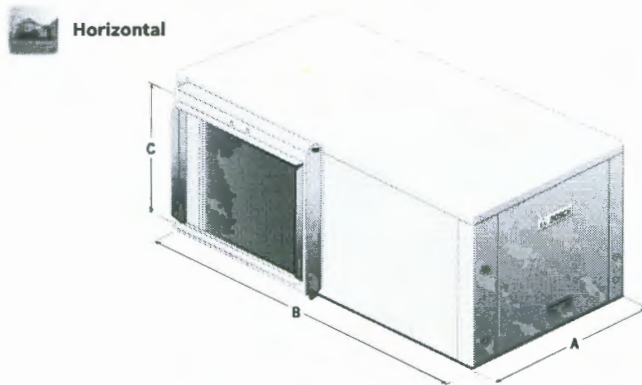


Additional benefits of financing include:

- ▶ No lien requirements filed on your home
- ▶ No home equity required at the time of application
- ▶ No points, fees, or closing costs associated with the loan process
- ▶ No prepayment penalty
- ▶ Fast, preferred rate unsecured financing
- ▶ New homeowners welcomed

APR, actual rate and payment subject to credit approval by AFC First. Rates subject to change. All loans are made directly to the consumer by AFC First Financial Corporation or Nova Bank on behalf of AFC First.

BP SERIES



Model	Dimensions					
	Vertical/Counterflow			Horizontal		
	A (width)	B (depth)	C (height)	A (width)	B (depth)	C (height)
BP007	21.50	21.50	32.75	21.50	43.00	17.00
BP009	21.50	21.50	32.75	21.50	43.00	17.00
BP012	21.50	21.50	32.75	22.00	45.00	19.50
BP015	21.50	21.50	39.50	22.00	45.00	19.50
BP018	21.50	21.50	39.50	22.00	45.00	19.50
BP024	21.50	26.25	47.50	26.00	54.50	22.00
BP030	24.25	33.50	47.50	30.00	68.00	22.00
BP036	24.25	33.50	47.50	30.00	68.00	22.00
BP042	26.00	33.50	58.50	30.00	79.00	22.00
BP048	26.00	33.50	58.50	30.00	79.00	22.00
BP060	26.00	33.50	66.50	30.00	89.00	22.00
BP070	26.00	33.50	66.50	30.00	89.00	22.00

ARI/ISO 13256-1 Performance Data

Entering Water Temperatures

Model	Fluid Flow Rate	Water Loop (WLHP)				Ground Water (GWHP)				Ground Loop (GLHP)			
		86°F		68°F		59°F		50°F		77°F		32°F	

Capacity And Efficiency Data

		Cooling Capacity	EER	Heating Capacity	COP	Cooling Capacity	EER	Heating Capacity	COP	Cooling Capacity	EER	Heating Capacity	COP
BP007	2.0	6,800	15.70	8,800	5.70	8,400	25.1	7,000	4.9	7,400	18.50	5,100	3.50
BP009	2.5	9,000	16.20	11,200	5.50	10,500	25.5	9,000	4.5	9,500	19.30	6,800	3.60
BP012	4.0	12,200	14.90	16,500	5.10	14,600	22.7	13,000	4.3	13,000	17.50	10,000	3.60
BP015	4.0	15,200	17.50	17,500	5.60	17,000	28.8	13,000	4.6	16,200	20.60	11,000	3.90
BP018	5.0	19,500	16.40	23,500	5.30	21,300	25.6	17,700	4.5	20,500	19.00	14,800	3.80
BP024	6.0	24,500	18.20	28,500	5.70	28,400	28.1	23,700	4.6	26,000	21.10	18,000	4.00
BP030	7.0	27,000	16.60	31,000	5.90	31,700	27.0	25,000	5.2	28,500	19.40	20,500	4.30
BP036	10.0	36,000	17.20	41,000	5.60	40,200	25.9	34,400	4.9	37,500	19.70	28,000	4.10
BP042	10.5	40,600	17.90	42,000	5.90	46,200	25.7	35,000	4.4	42,000	21.20	28,000	4.10
BP048	12.0	48,000	17.10	50,000	5.30	53,600	25.5	40,500	4.3	50,200	19.80	33,400	3.70
BP060	15.0	62,000	17.10	72,000	5.80	67,600	24.4	56,700	4.9	64,500	19.50	47,000	4.30
BP070	17.0	68,000	16.20	86,000	5.60	71,400	22.4	71,400	5.0	70,500	18.50	56,500	4.20

Follow The Leader

Bosch's Limited Residential Warranty* Coverage for your Geothermal Heat Pump

Your Bosch Geothermal Heat Pump system is a smart investment not only in clean and renewable energy, but also in your future - which is the reason why our geothermal heat pump products, engineered with more than 40 years of experience, come with a warranty you can rely on.

With the limited residential warranty, you receive peace-of-mind knowing you will receive replacement parts protection for up to 10 years. This standard offering covers all components incorporated into the unit cabinet at the time of manufacture. Other components or parts that are purchased from FHP/Bosch and installed in the field have a 1 year replacement parts warranty** from proof of certificate of occupancy date or proof of certified start up date.

Additionally, a standard 10 year labor-allowance*** is included for the replacement of any defective component to help offset labor expenses if a component should fail. This is the freedom consumers expect when purchasing products listed in the Energy Star program.

After all, you bought the best - the ultimate freedom the Bosch brand offers.

Bosch Group's Limited Residential Warranty* includes the following:

Components

- ▶ Compressor: 10 years
- ▶ Refrigerant circuit: 10 years
- ▶ All other internal parts assembled by Bosch: 10 years

Labor allowance***

- ▶ Refrigeration circuit parts: 10 years
- ▶ All other internal parts: 10 years

If you are ready for the peace-of-mind that Bosch's warranty coverage provides, it is easy to get started. Take the First Step and contact a Bosch Group certified representative near you. For a contractor listing go to www.bosch-climate.us.

**For complete Warranty details please review the warranty card provided with the product or visit www.bosch-climate.us.



Bosch system integration reinventing energy efficiency



Bosch Tankless Water Heaters

Whether you are building your dream home or simply remodeling your current home, there's a Bosch tankless water heater designed for your needs. Every unit delivers ultra high efficiency and is built to stringent Bosch quality standards. With a Bosch tankless water heater you will get an endless supply of hot water and can cut your current water heating bill in half.



Bosch Solar Thermal Systems

Bosch solar hot water solutions bring the first-class technology, innovation, reliability, quality and environmental sustainability that Bosch is known for world-wide, to the next level. These systems are designed for superior energy efficiency. This is especially true when combined with a Bosch high efficiency tankless water heater as a back-up system. There is no better choice for your home than a solar thermal system from Bosch to reduce your energy expenses and your carbon foot print.



Bosch Controls

We supply a wide selection of advanced controls to ensure that your heating and domestic hot water system delivers high efficiency and reliable heating year after year. Bosch controls give the heating engineer quick and easy access to all functions of the heating system and also allows the integration of multiple heating products.



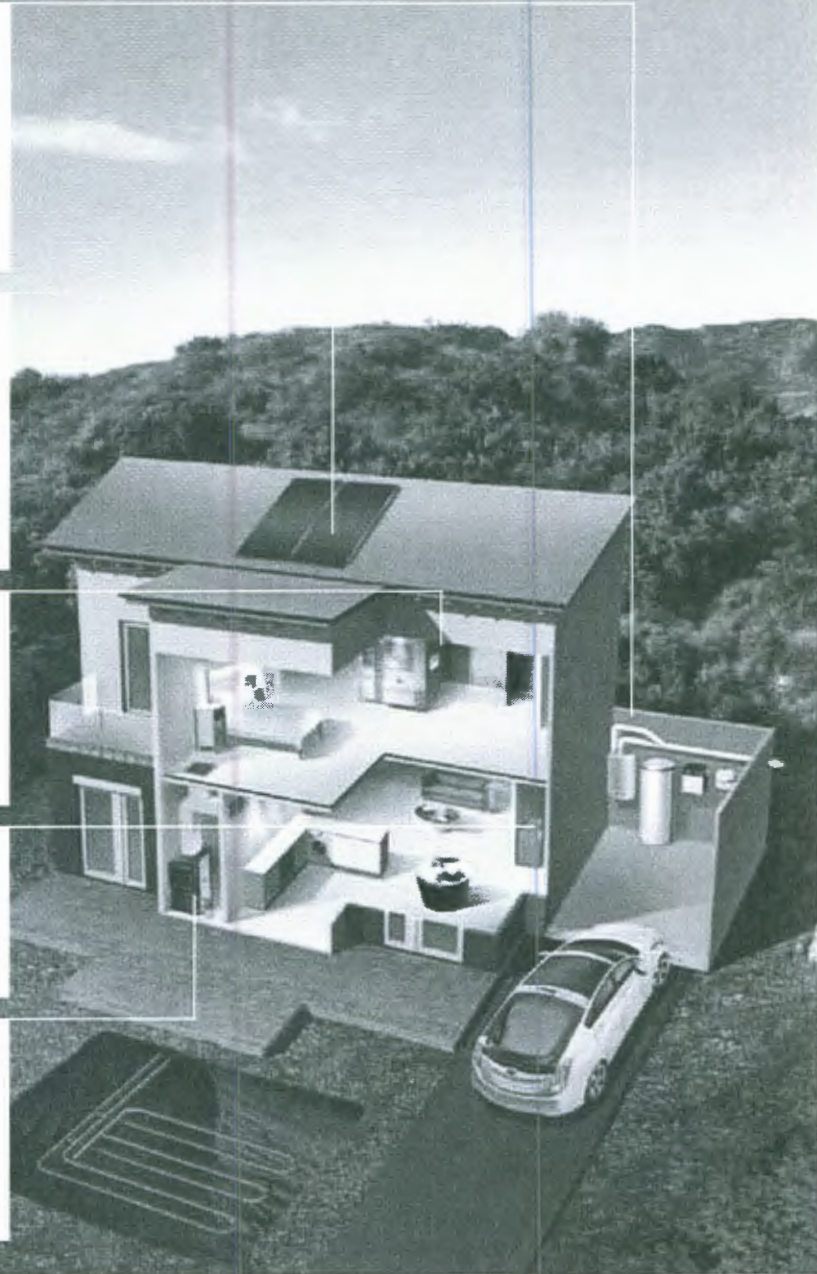
Buderer Boilers

Our extensive boiler line includes energy efficient cast iron boilers, as well as the very latest aluminum condensing boilers and multiple boiler cascade systems for maximum energy efficiency.



Bosch Geothermal Heat Pumps

Our high efficiency water source heat pump systems provide the most flexible and lowest installation costs of virtually any HVAC system. These systems are the most energy and cost efficient systems on the market making them the greenest technology and the smartest investment for residential heating and cooling applications.



Geothermal, solar, tankless and boiler solutions from Bosch

Bosch is committed to reinventing energy efficiency by offering smart geothermal, solar, tankless and boiler products that produce domestic hot water and indoor comfort solutions. Bosch products work alone or together as an integrated system to provide contractors, mechanical engineers and architects the opportunity to customize unique energy efficient systems for your home.

To learn more about these products and Bosch systems visit the Energy Efficiency Home at www.bosch-climate.us



Bosch Thermotechnology Corp.

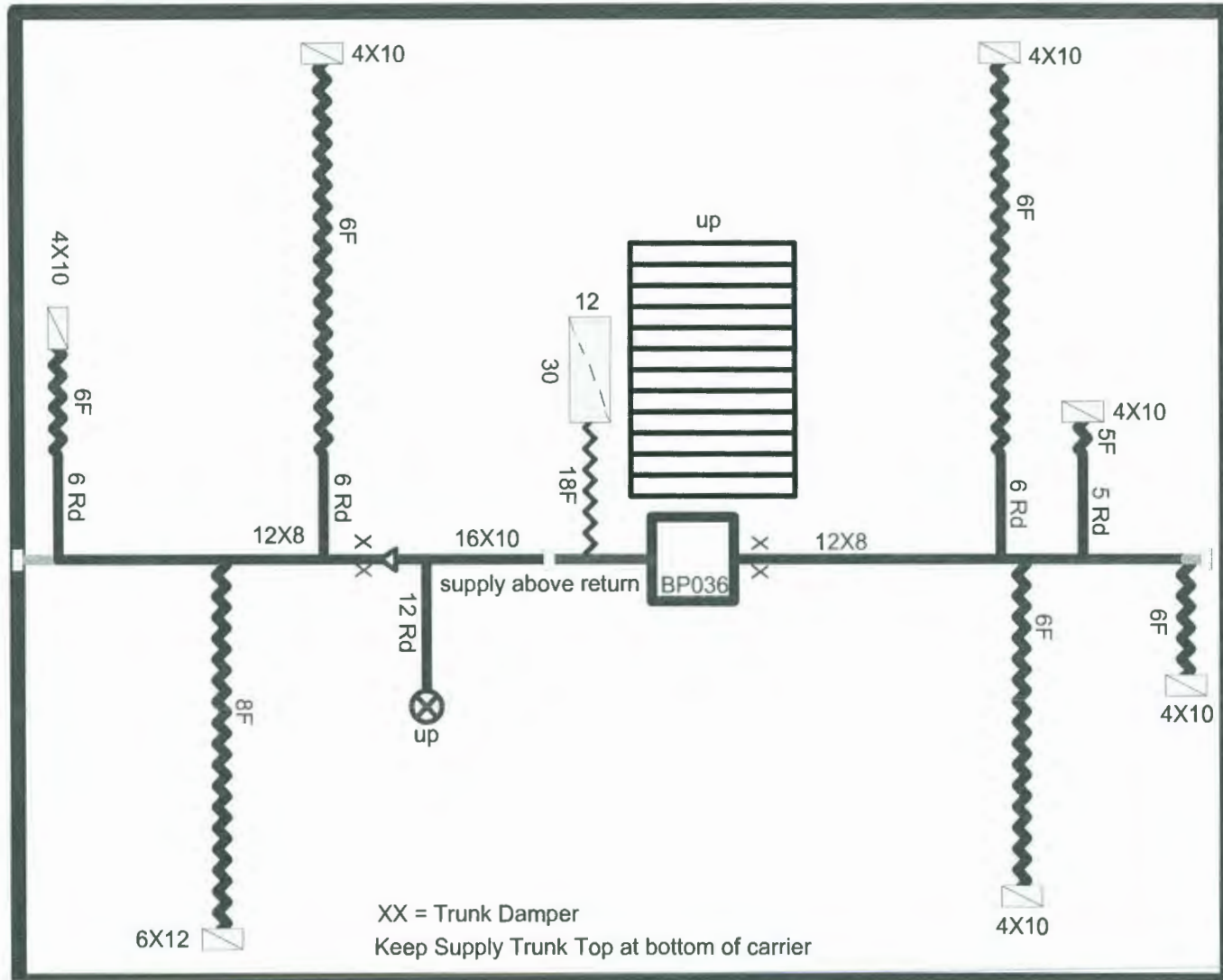
601NW 65th Court
33309 Fort Lauderdale
Phone: 954-776-5471
Fax: 954-776-5529
www.bosch-climate.us

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minimum 10% PCW paper with vegetable-based inks.





BASEMENT



Job #: 11-2312-111

GRIFFIN RESIDENCE
109 Edwards St
Portland, ME

DUCT LAYOUT

EVERGREEN GEOTHERMAL, LLC

8 Misty Way
Falmouth, ME 04105
Phone: 207-650-5098
Dave@evergreengeo.com

Scale: 1/4" = 1'0"

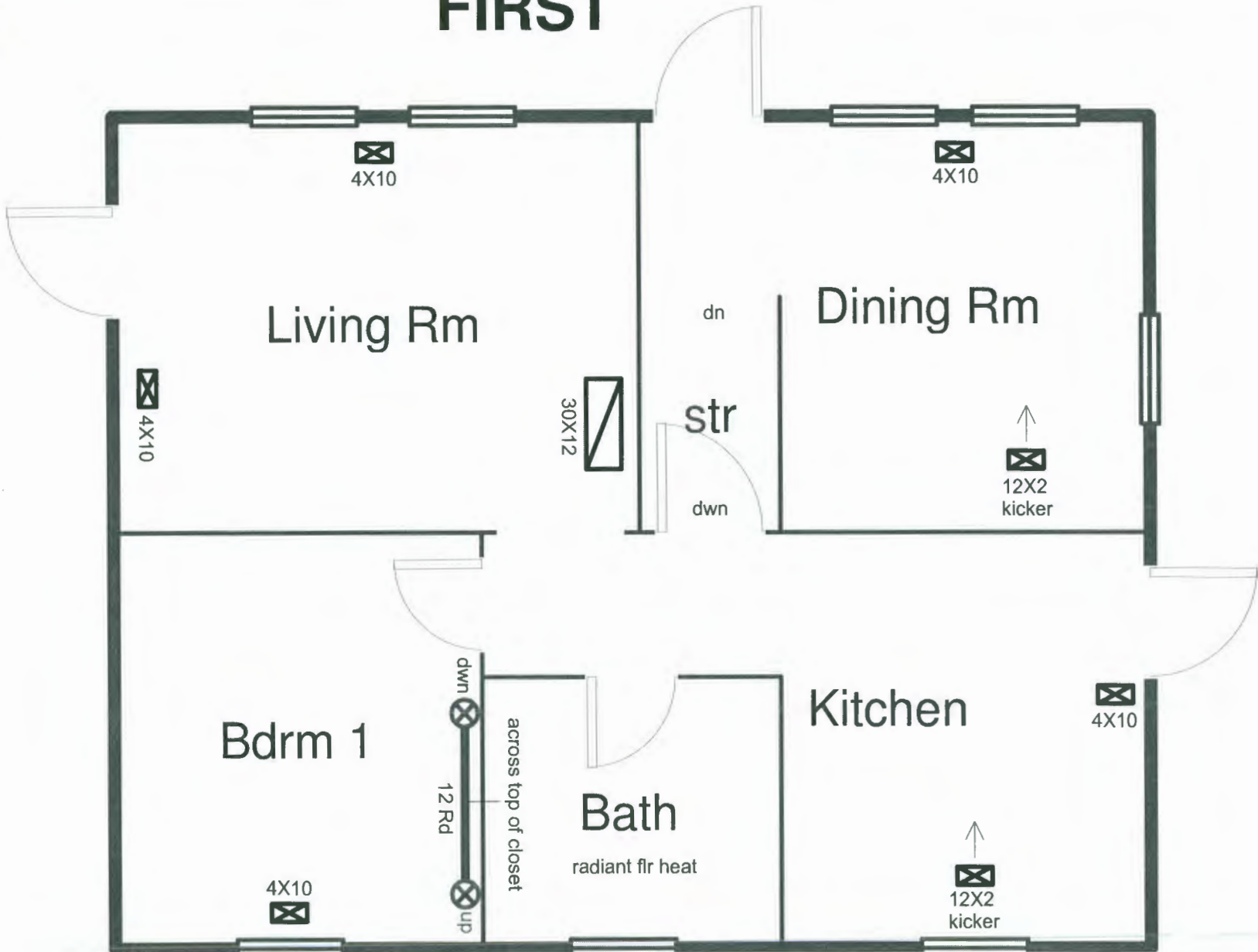
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December 27, 2011



FIRST



Job #: 11-2312-111

GRIFFIN RESIDENCE
109 Edwards St
Portland, ME

DUCT LAYOUT

EVERGREEN GEOTHERMAL, LLC

8 Misty Way
Falmouth, ME 04105
Phone: 207-650-5098
Dave@evergreengeo.com

Scale: 1/4" = 1'0"

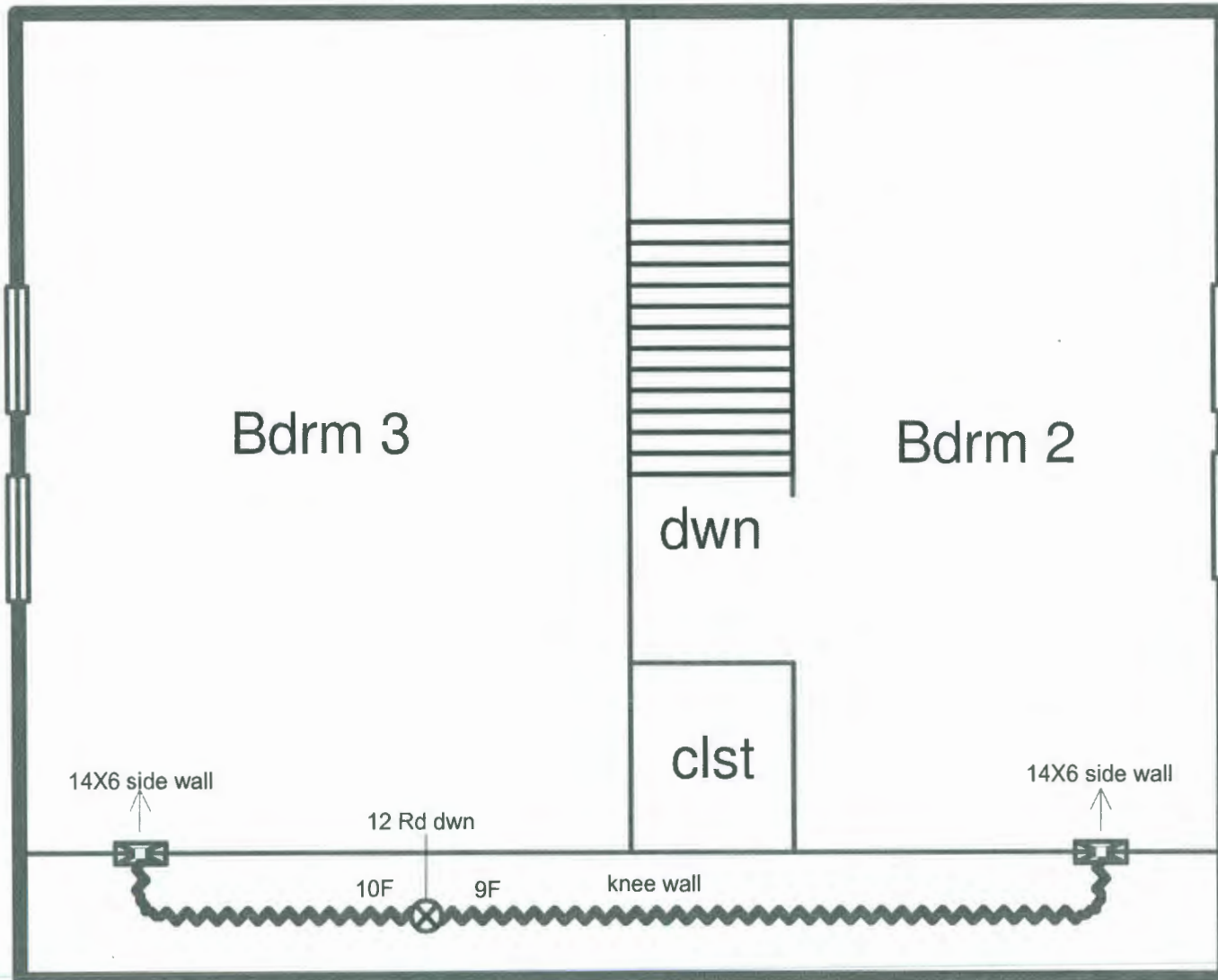
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December 27, 2011



SECOND



Job #: 11-2312-111

GRIFFIN RESIDENCE
109 Edwards St
Portland, ME

DUCT LAYOUT

EVERGREEN GEOTHERMAL, LLC

8 Misty Way
Falmouth, ME 04105
Phone: 207-650-5098
Dave@evergreengeo.com

Scale: 1/4" = 1'0"

Right-Suite® Universal
8.0.24 RSU02894
Page 3 of 3

December 27, 2011

Venture 3520CW[®]

Stands up to the Cold



3520CW[®]

- Temperature range -35° F to +260° F
- CW[®] solvent acrylic pressure sensitive adhesive
- Specifically designed for sealing sheet metal ducts and metal duct connections
- HVAC Industry Leading Foil Tape for Metal Ducts



VentureTape[®]

800-343-1076
www.venturetape.com

3520CW®

Foil Insulation Tape UL723 Listed

Description

Venture Tape 3520CW® COLD WEATHER FOIL is a 2.0-mil (50µm) annealed aluminum foil coated with Venture's CW® cold weather solvent acrylic pressure sensitive adhesive. The malleable foil applies easily to both fibrous and sheet metal ducts and conforms to irregular surfaces. Venture Tape 3520CW® excels in demanding temperature and humidity applications and provides superior performance and durability over a wide range of environmental conditions.

Applications:

High performance foil insulation tape is specifically designed for sealing sheet metal ducts and metal duct connections.

Technical Data

	Imperial	Metric
Thickness	3.7 mils	94 µ
Peel Adhesion	100 oz/in	27.7 N/25mm
Shear Strength	>168 Hours	>168 Hours
Tensile Strength	34 lb/in width	151 N/25mm width
Elongation	5%	5%
Temperature Range:	-35° F to +260° F	-12° C to 177° C
Mold Growth	0	0
Roll Size	2, 2 1/2, 3 inches x 50 yds	5.1, 6.4, 7.6 cm x 46m

Important Information:

The information cited is in good faith and has been established from sources held to be secure and reliable. The values listed are typical properties. Users must determine the product suitability for the end use application and assume all risks and liabilities.

VentureTape®

Venture Tape Corp.
30 Commerce Rd., Rockland, MA 02370
Tel 781 331-5900; Fax 781 871-0065
800 343-1076 (U.S.A.), 800 544-1024 (Canada)
www.venturetape.com

HV018
09/08

Performance Data (Applies to all products)

- Rated Positive Pressure 10" W.C. per UL 181
- Rated Negative Pressure 1/2 W.C. per UL 181
- Velocity 6,000 FPM
- Temperature Range -20°F to 200°F (Intermittent) / -20°F to 180°F (Continuous)
- Flame Spread/Smoke Developed Less than 25/Less than 50

LIMITED WARRANTY | LIMITATION OF LIABILITY | DISCLAIMER OF UNSTATED WARRANTIES

The flexible air duct is warranted by QuietFlex® Manufacturing Company, L.P., for five (5) years against defects in material and workmanship. This warranty is for exchange of duct only and does not include installation.

WARRANTY EXCLUSIONS

Warranty is excluded if flexible air duct is used in the following installations / applications:

1. Where duct is exposed to direct or indirect light.
2. Where duct is used on the high - pressure side of variable air - volume (VAV) systems.

LIMITATION OF LIABILITY

QuietFlex's® liability for damages, whether in contract, in tort, under warranty, in negligence or otherwise, shall not exceed the return of the amount of the purchase price paid for the QuietFlex® products. QuietFlex® shall not be liable for special, indirect or consequential damages. Specification and performance data listed herein are subject to change without notice.

DISCLAIMER OF UNSTATED WARRANTIES

This warranty is the only warranty of QuietFlex® products. All other warranties, expressed or implied, including, but not limited to, warranties of merchantability and fitness for a particular purpose are expressly disclaimed. QuietFlex® is a registered trademark of QuietFlex® Manufacturing Company, L.P.



Quietflex®

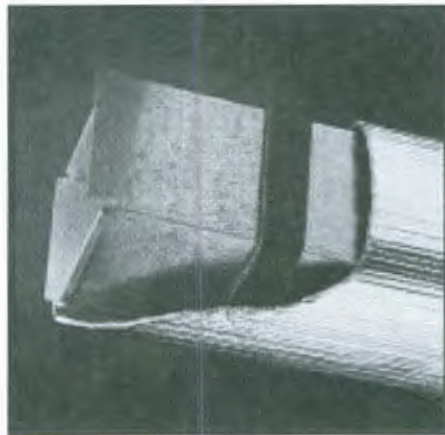
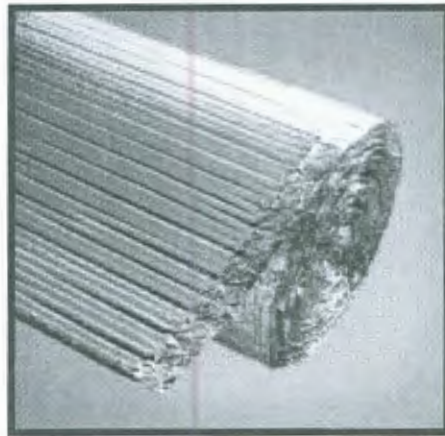
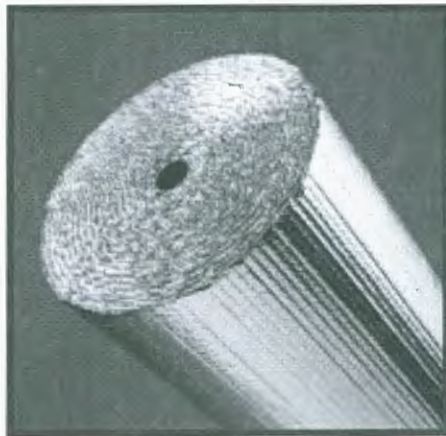
QuietFlex Manufacturing Company, L.P.
 4518 Brittmoore Road
 Houston, Texas 77041
 Phone 713.849.2163
 Fax 713.849.0753
 Toll Free 877.694.3669

www.quietflex.com

Reflectix® Insulation

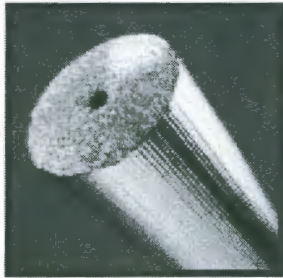
Solutions

for Today's HVACR Professional



**Providing Technologically Advanced Products
and Accurate Information for the HVACR Professional**

From All at Reflectix®



It has been a pleasure during the time we have been in business, to talk with a variety of our customers. These discussions have been helpful in creating this brochure. Included you will find an installation guide, a simplified source of technical information, and an idea resource with creative uses for Reflectix®.

Our goal is to inform consumers of the cost saving advantages of using Reflectix®. To our customers, we say "Thank you!" and to our new customers we say "Welcome!" We invite you to explore this brochure and consider the many benefits that are available to you as a Reflectix® user.

As always, we look forward to hearing from you. Your questions and comments are our best measure of success in serving you!

Your friends at Reflectix


Over the years, Reflectix has collected and continues to collect test data on the more popular applications using our insulation products. This brochure is the culmination of that research. On the following pages, we will discuss many of these applications in detail including their R-values, additional benefits and installation procedures.

Through the use of independent certified labs and government approved laboratories, Reflectix conducted tests on complete wall, floor, pipe and duct assemblies insulated with Reflectix®. These tests have enabled us to provide you with the most accurate and useful information possible on thermal performance and system R-values.

System R-values report the thermal resistance of complete assemblies, including insulation, studs, floor joists, furring strips and any other building materials a particular application may involve.

If you have questions on a specific application, call our toll free number today, 1-800-879-3645 or visit our website at www.reflectixinc.com.

**REFLECTIX® INSULATION.
IT WORKS! IT'S JUST THAT SIMPLE.**

	ENERGY STAR HOME SEALING
<small>EPA recommends sealing the "envelope" that surrounds your living space: • the ceiling • outer walls • windows • floors</small>	To save on your heating and cooling bill and increase the comfort of your home: <ul style="list-style-type: none">• Add insulation• Seal air leaks• Choose ENERGY STAR qualified windows when replacing windows
<small>ENERGY STAR is a program of the U.S. Environmental Protection Agency and the U.S. Department of Energy.</small>	www.energystar.gov

Reflectix® Insulation is an ENERGY STAR qualified product as a part of EPA's Home Sealing effort.

SAFETY TIPS

ALWAYS CHECK LOCAL BUILDING CODES BEFORE INSTALLING REFLECTIX®.

ALWAYS USE EYE PROTECTION WHEN USING STAPLE GUNS OR SCREW GUNS.

ALWAYS EXERCISE CAUTION AROUND ELECTRICITY.

ALWAYS CHECK THE AREA YOU ARE INSULATING AND MAKE ANY NEEDED REPAIRS BEFORE BEGINNING. ANY WORN WIRING SHOULD BE REPLACED BEFORE INSTALLING REFLECTIX®.

REFLECTIX® WAS DESIGNED TO WORK BEST WHEN AN AIRSPACE OF 1/2" TO 3/4" HAS BEEN USED.

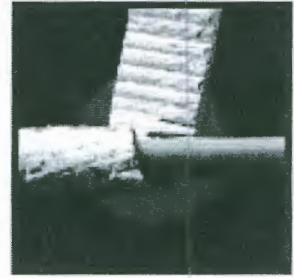
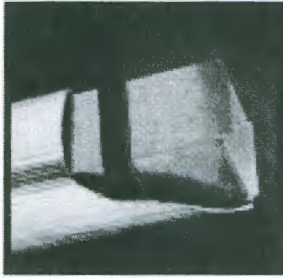
MAKE SURE WORK AREA IS WELL VENTILATED AND WELL LIGHTED.

WHEN WORKING WITH REFLECTIX® PRODUCTS OUTDOORS, WEAR SUN GLASSES.

BE CAREFUL WHEN WORKING WITH LARGE PIECES OF REFLECTIX® ON WINDY DAYS.

DO NOT WORK IN AREAS OF A BUILDING, SUCH AS THE ATTIC, WHEN TEMPERATURES ARE TOO HOT.

Plumbing/HVAC Ducts and Pipes



DUCT INSULATION - R-6

Energy costs can be greatly reduced by wrapping ducts with Reflectix® virtually eliminating unnecessary heat loss, gain and air leakage. Reflectix® helps to ensure consistent temperatures.

- 1) Before installing Reflectix®, make sure all joints in sheet metal ductwork are tightly sealed.
- 2) Secure spacers every 24" to 36" around ducting, fastening the spacers with UL181 approved HVAC foil tape. This will provide the necessary air space for the most effective use of Reflectix®. Reflectix® spacer product is recommended.
- 3) Reflectix® Standard Edge material can then be cut to the proper size and wrapped around the duct.
- 4) Tape all seams with UL181 approved HVAC foil tape.

Note: In humid regions, Reflectix recommends wrapping the duct with spacer strips before applying the insulation.

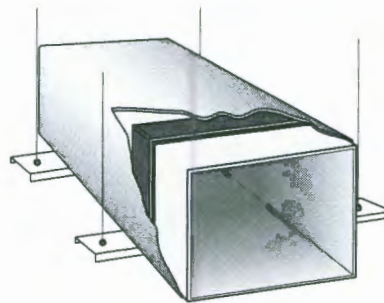
SPIRAL DUCT INSULATION - R-4

- 1) Simply spiral around the duct, overlapping 1" as you go. Do not leave any open air space or exposed duct.
- 2) Fasten each end of Reflectix® to the duct using UL181 approved HVAC foil tape.

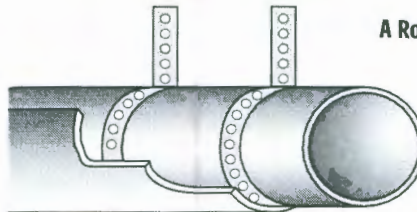
LINEAR PIPE WRAP - R-4

To help reduce condensation on cold pipes and heat loss on hot pipes, wrap them with Reflectix® Insulation.

- 1) Cut a length of pipe wrap from the roll that will be easy to handle in your working area. Place the white side of the insulation next to the pipe.
- 2) Pre-shape the insulation by wrapping it around the pipe. This will make the taping easier and help to form a better seal.
- 3) Remove the protective backing from the tape and overlap the edge so it just covers the tape area. On small pipes this will produce a loose fit and on larger pipes, a snug fit. Insulation value is not affected by a loose or tight fit.



Shown below:
A Rectangular Duct with a
Saddle Hanger



Shown below:
A Round Duct with a Wire or
Strap Hanger

SPIRAL PIPE WRAP - R-4

- 1) Simply spiral Reflectix® Pipe Wrap around your pipes, overlapping 1/2" as you go.
- 2) Securely tape with UL181 approved HVAC foil tape around each end of your wrapped product. This procedure provides an air space that will aid the insulation value. Do not leave any exposed pipe or space where air can enter between the pipe and the wrap.

OUTDOOR DUCT INSULATION - R-6

Install Reflectix® Outdoor Duct Insulation on the exterior of rectangular or round sheet metal ducts and spaces, or surfaces where temperature and condensation must be controlled. Reflectix® Outdoor Duct Insulation will save on labor expenses. The insulation conforms to duct surface easily for faster installation.

Testing and Certification

All tests on Reflectix® Insulation are performed at either nationally approved independent laboratories or at leading universities. Tests are performed to current American Society of Testing and Materials (ASTM) Standards when a standard exists. For a copy of any of the actual test reports, call 1 (800) 879-3645.

Nominal Thickness	5/16" (.312)
Weight	1.25 oz./ft ²
Temperature Range	-60° to 180°F
Flame Spread	20*
Smoke Development	30*
Perm. Rating	.02**
Puncture Resistance	60 lb./in.***
Vapor Transmission	.02
Mold and Mildew	No Growth
Emittance	.03
Tensile Strength	3.7 N/mm
Pliability	No Cracking
Hot Surface Performance	Passed

*United States Testing Company, Inc. ASTM Test Method E-84
 ASTM Test E-96 • *FSTM 101 B Method 2031

PRODUCT STANDARDS

Resistance to fungi or bacteria: Reflectix® does not promote the growth of fungi or bacteria.

Specification compliance: Reflectix® is covered under the Federal Minimum Standards Code for reflective insulation (HH-I-1252B) for all H.U.D. and F.H.A. projects.

Reflectix® products have been evaluated by the following:

- I.C.B.O. ES Evaluation Report No. 4933
- C.C.M.C. ES Evaluation Report No. 12342-R
- B.O.C.A. ES Evaluation Report No. 91-49.1
- S.B.C.C.I. PST & ESI Evaluation Report No. 94102A
- Dade County Evaluation Report No. 03-0514.14
- Los Angeles County Evaluation Report No. RR8099

See Evaluation Reports listed above for allowable values and/or conditions of use concerning material presented in this document.

AVAILABLE TESTING AND CERTIFICATIONS

- Thermal Performance ASTM C236
- Thermal Performance of Wall Systems ASTM C236
- Thermal Performance ASTM C518
- Thermal Performance of Crawl Space ASTM C236
- Thermal Conductivity and Thermal Resistance of Blanket ASTM C518
- Hot Surface Performance ASTM C411
- Heat Transfer (Heat Flow Up, Down, Horizontal) ASTM C236
- Thermal Performance of Reflectix® and Fiberglass in Walls ASTM C236

- Heat Transfer of Air-Handling Ducts with Reflectix®
- Flame Spread and Smoke Density ASTM E84
- Flame Spread and Smoke Density Single Bubble ASTM E84
- Flame Spread and Smoke Density Single Bubble White ASTM E84
- Adhesive Bleeding ICBO Acceptance Criteria
- Flammability FMVSS 302
- Fungus Resistance Mil-Std 810B Method 508
- Pliability Test
- Sound Absorption Test ASTM C423-90a and ASTM E795-83
- Sound Transmission Loss ASTM E90-90 and ASTM E413-87
- Water Vapor Transmission ASTM E96
- Tensile Strength
- Emittance Testing
- Thermal Performance of Water Heater Jackets
- NVLAP Approved Lab Test: Adhesive Bleeding per ICBO Evaluation Service Report # LA 73577
- NVLAP Approved Lab Test: Flame Spread Classification/Smoke Density Developed (Taped Joint Detail) Test Report # LA 62595-1
- NVLAP Approved Lab Test: Flame Spread Classification/Smoke Density Developed (Unslit) Test Report # LA62517-2
- NVLAP Approved Lab Test: Flammability of Interior Materials Report # LA72357-2
- NVLAP Approved Lab Test: Fungus Resistance MIL-STD-810B Method 508 Report # LA 73598
- Southern Building Codes Congress International (SBCCI) Report # PST & ESI 9375
- State of California
- State of California Licensed Insulation Manufacturer
- State of Minnesota: Filed with Minnesota Insulation Standards Program
- State of Wisconsin: Wisconsin Material Approval, Safety and Buildings Division Approval # 920088-1
- Tennessee Technological University Emittance Testing
- Warnock Hersey Professional Services, LTD: Physical Properties Sheet Width, Length, Pliability, Water Vapor Permanence and Aged Water Vapor Permanence Report # 1/92
- Warnock Hersey Professional Services, LTD: Water Vapor Transmission Test ASTM-E96 (Desiccant Method) Report # 1/91

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