The INSULATION Man

Thermal Insulation Systems for New Construction

"Our mission is to promote energy independence through comfort, efficiency and lower heating and cooling costs to our customers."

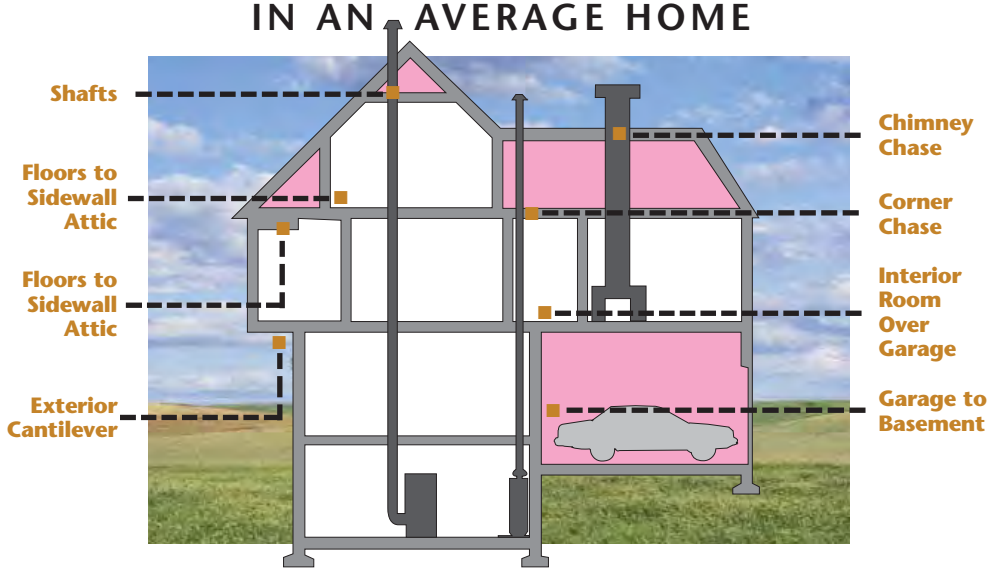
THE INSULATION MAN

The Insulation Man is a full service Home Performance Contracting Business that has existed under current management since 1989. Our company provides effective building envelope solutions for new construction and retrofits of older homes and businesses within an 80 mile radius of Binghamton, NY. We offer technical assistance with home performance issues including moisture, heat loss, and indoor air quality. We use diagnostic equipment and our own experience and knowledge to find problems and recommend solutions. Once the problems are known, we use urethane foam, cellulose, and other materials to repair faults in the building envelope. We also use Subcontractors to repair or replace HVAC equipment and distribution systems, and windows or doors.

WE BELIEVE:
...that the house should be viewed as a system
...that all building components are interrelated
...that changing one aspect affects another
...that insulation and air sealing will tighten a house and may trap odors, molds, radon and combustion byproducts

WE TEST:
...combustion appliances to see that they operate safely
...the integrity and tightness of the building envelope
...your home looking for characteristics in the house that will affect your comfort, safety, and budget, and explain them so you can confidently decide on solutions.

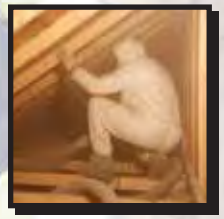
TYPICAL AIR LEAKAGE AREAS IN AN AVERAGE HOME



SERVICES AND CAPABILITIES

Insulation Types

Blown in Cellulose
Blown in cellulose is much better than traditional fiberglass insulation at stopping all components of heat loss. By design, this product will fill all voids in insulated spaces. It is also typically installed at higher densities than fiberglass batt insulation, allowing it to be much more suitable to stop convective heat loss. The R value of this product will also be more stable in adverse weather conditions than batt products because of its higher density. Following are the typical types and means of installation:



Loose: In a blown cellulose installation, the material is simply blown into place in a loose, unconsolidated state. This is commonly done in attics, where the cellulose is supported by the ceiling beneath. Because the nature of blown cellulose causes it to settle over time, extra material is added in the initial application.

Dense Packed: Cellulose can be blown in closed cavities like walls, or cathedral ceilings, but in these situations it must be installed at greater density to prevent settling. This process is called "dense packing", and it is an effective air barrier system.

Spray Cellulose: Spray cellulose is installed at higher densities in open wall cavities. It is an effective air seal when it is installed in cavities that will have an interior finish, and it has a good R value. It is the least expensive and most effective insulation product available for closed wall cavities. However, it is not appropriate for all surfaces requiring insulation.

Polyurethane Foam
This is the most versatile insulation product. It is spray applied, adhesive, and becomes part of the wall when installed. Polyurethane actually adds structural rigidity to the building components.

Performance Consultation

Plan Review
The Insulation Man can review plans with owners and contractors to assist them in providing answers to energy questions and decisions concerning the "House as a System" building practices.

Ventilation – there are 3 types of ventilation in homes:
- Make Up Air – for combustion and exhaust only systems
- Roof Ventilation – to prevent roof rot
- Fresh Air Ventilation – to mitigate moisture and retain healthy air

Insulation – We ask these questions:
- How airtight can and should we make this home?
- What happens if we install a hot tub or a vent free fireplace? What type of insulation is best in this application? Why?
- What type of insulation is the least expensive? What type is the best at air sealing? Highest R value?
- Why did the Architect specify R-49 for the roof? Can we do better with less?

Moisture – We'll find the answers to these questions:
- What sources of water are in this home?
- How can we control the Relative Humidity without wasting energy?
- Will a humidifier be necessary on the furnace? Why?
- How much fresh air ventilation should we plan for?

Heating System – We ask these questions:
- What limitations will the heating system have?
- Can we get the heat from the furnace to the rooms properly? What about return air?
- Will a furnace work better than a boiler? Why is a 96% efficient furnace sometimes less efficient than an 85% efficient boiler?
- What is the safest way to make hot water?

The Insulation Man knows how these types of systems interact, and can assist you in understanding them.

Testing

We use both the Blower Door and an Infrared Scanner to test for air sealing. When used together, these devices can pinpoint air leakage paths, allow the contractor to improve his air sealing package and improve energy performance.

Blower Door: This device creates a small vacuum inside the structure and measures the flow necessary to maintain that vacuum. By comparing this flow rate with similar homes, we can understand the efficiency of your house We can also make determinations about the need for fresh air ventilation, make up air, and heating system size.

Infrared Scanner: This device allows us to find flaws in the insulation system and trace air leakage paths. We can actually see the heat patterns on the walls, allowing us to determine where the insulation is and where it isn't working. We can then make precision repairs as necessary without tearing out walls or damaging building finishes.

Duct Blaster: This device allows us to measure the ductwork leakage in a home, and where to find it. If your home is heated with a duct system, it may be leaking hot air, compromising heat efficiency and costing you money.

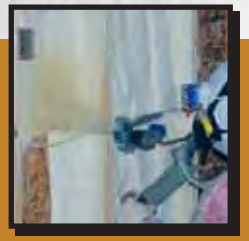
Combustion Safety/ Efficiency Inspection: We test for carbon monoxide emissions in gas appliances. Improperly vented appliances can cause carbon monoxide poisoning and allow heat to escape. Making the furnace and water heater more efficient reduces the amount of heat that escapes through the chimney. Less heat equals less draft, and a higher probability that the exhaust from these appliances may not exit the home. We advise people not to use vent-free heating appliances, and will take the time to explain why.

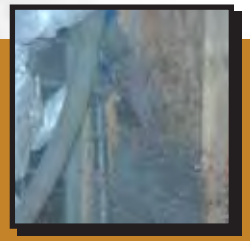
INSULATION PROCESS

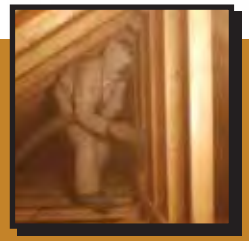
The best insulation system is both cost-effective and performs well. That's why we recommend a combination of urethane foam and blown insulation.

Insulation failure

Successful insulation


Spray foam insulation


Spray cellulose insulation


Loose fill insulation

Conventional House	"House as System" Performance House
Used in conventional housing for over 25 years.	**Most energy efficient, safer and more comfortable.**
Uses R-19 walls, R-38 attic, fiberglass batts	Uses R-19 walls, R-38 attic, cellulose and urethane
Oversized HVAC system ■ Compensate for duct leakage, air infiltration and insulation voids.	**Correctly sized HVAC system** ■ No duct leakage or insulation faults. Efficient performance.
Wall and floor cavities serve as duct runs ■ Cheap to build, been done for years. May cause moisture build-up and introduction of carbon monoxide and outside allergens.	**Sealed duct system, both supply & return.** ■ Moisture and carbon monoxide are controlled at the source. Pollen is removed by the ventilation system.
Plumbing lines run where they will fit. ■ May produce frozen pipes or cold tub/shower unit.	**Designed chases for plumbing & HVAC inside the thermal and pressure boundaries** ■ No frozen pipe or cold tub/shower unit
Cheap (initial price) recessed lights ■ Possible cause of air contaminants. Aids in the development of ice dams & mold.	**Airtight, insulated recessed lights** ■ No ice dams & mold.
Attic Bypass ■ Leaves the top of the shower visible from the attic. Cheaper and easier than the right way. May produce cold shower, ice melt on the roof right over the shower, ice dams near the bathroom windows in some houses.	**No Attic Bypass** ■ No cold showers. No snow on the roof over the bathroom. No ice dams. Similar solutions seen in the kitchen area due to insulated ductwork.
"Natural" Ventilation ■ Caused by bypasses venting through attic. Leads to running a humidifier, air purifier and furnace to achieve comfortable air flow in winter and stagnant air in summer. May produce mold and promote dust and allergies.	**Mechanical Ventilation** ■ One third of the total air volume in the house is recycled every hour of every day. The recycled air is heated for a cost of about 15¢/sq.ft. of living space per year. Benefits are cleaner air, less dust and no mold.

The "House as a System" Building Plan

If you build your home with an energy system plan, you'll not only be investing in your comfort and safety, but you'll be saving energy and money for years to come. Using the "House as a System" building approach may initially cost more than conventional building but your return on investment is high. Put in perspective, the cost is less than the cost to upgrade to any of several cosmetic finishes like granite countertops, tile flooring, or custom bathtubs, which most owners change within 10 years. Once properly installed, your insulation system cannot be modified or replaced unless you modify or replace outside walls, floors, or a roof.

The initial cost of the "House as a System" approach can be amortized in your mortgage, and the monthly cost is likely to be less than half of the cost of the energy saved by the improvements. In other words, you have positive cash flow from this decision from the first day onward, and as the cost of energy goes up, you will increase that positive cash flow.

Finally, your home will be more comfortable, more durable, and safer to occupy than any conventionally built home.

The Insulation Man will customize YOUR plan to YOUR house. Taking into consideration cost effectiveness and performance, we will work with you and your contractor to develop an energy system that will work for YOUR needs. Call us today to find out how we can save you money and make you and your family safer, warmer and more comfortable.

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