

Technical Support

Nu-Wool Company makes a product that they proudly stand behind. Because of the guaranteed energy efficient qualities of this insulation, we provide technical support throughout the construction of the building. This support is offered to the architect, the building official, the builder and the insulation contractor. If there is a problem or you need help with an issue, contact the Technical Services Department and get the answers you need – 800.748.0128.

THE TECHNICAL SERVICES DEPARTMENT OFFERS THE FOLLOWING SERVICES

- ✓ **Blower Door**
- ✓ **Infrared Analysis**
- ✓ **Moisture Testing**
- ✓ **Acoustic Troubleshooting**
- ✓ **Calculating BTU Loads**
- ✓ **Energy Usage Analysis**
- ✓ **Duct Blaster Technology**
- ✓ **HVAC Sizing**
- ✓ **Resolving Building Code Issues**
- ✓ **Recommendations for Proper Installation**



What Is A Blower Door?

A Blower Door is a diagnostic tool used to measure and quantify the air tightness of houses and residential duct systems. The Blower Door Consists of a powerful calibrated fan, an adjustable door frame to seal the fan into an exterior doorway of a house, and gauges to measure fan flow and house pressures created by the fan. In a typical Blower Door depressurization test, the fan blows air out of the house to create a slight pressure difference between the inside and outside of the house. This pressure difference forces outside air into the house through all holes, cracks and penetrations in the building envelope.

House air tightness rates are calculated from the house pressure and fan airflow rates. In addition to determining house air tightness, the Blower Door exaggerates existing air leakage paths making them easy to locate with a smoke generator, infrared camera, or simply feeling with your hands.

Building Air tightness:

Building air tightness is a measure of how much air passes through the outside building envelope at a specified reference pressure. The house reference pressure most commonly used in Blower Door tests is 50Pa (or .2" w.c.) of pressure between the inside and outside of the house. Air tightness measurements are typically presented in two formats: Air Changes per Hour at 50 Pa (ACH50) and Cubic Feet of Air per minute at 50 Pa (CFM50). Blower Door tests are performed at a reference pressure which is significantly greater than the driving forces

associated with natural infiltration in order to improve measurement accuracy and repeatability.

Why Blower Doors Make Good Sense

In New Construction:

- The air tightness of a house is key to its overall performance. Uncontrolled air leakage results in high fuel bills,
- Failure of building components and increased callbacks. A Blower Door quickly and simply lets you measure the air tightness of your houses and pinpoint problem leakage sites.
- Unknowingly building tight homes without mechanical ventilation can lead to moisture and other indoor air quality problems. A Blower Door test allows you to estimate natural ventilation rate of a house so you can predict when mechanical ventilation is needed.
- House air tightness is an important component of combustion safety. Knowing the air tightness of a house can help you predict the likelihood of a pressure induced spillage problem from exhaust fans or other combustion appliances.



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Minneapolis Duct Blaster

There are more than a million miles of duct work in U.S. homes. And industry experts estimate that more than two-thirds of them are leaky enough to justify sealing or repair. Leaky ducts can significantly increase air conditioning and heating bills, dramatically reduce equipment capacity and performance, as well as result in potentially dangerous indoor air quality problems. In fact, duct leakage is responsible for many of the comfort complaints experienced by homeowners today.

The **Minneapolis Duct Blaster** is used to directly pressure test the duct system for air leaks, much the same way a plumber pressure tests water pipes for leaks. The Duct Blaster fan is first connected to the duct system at the air handler cabinet, or a return grille. After temporarily sealing all remaining registers and grills, the Duct Blaster fan is turned on to force air through all holes and cracks in the ductwork. The fan speed is increased until a standard test pressure is achieved in the duct system. A precise duct airtightness measurement is then made using the DG-700 Digital Pressure and Flow Gauge connected to the Duct Blaster system.

Estimates of efficiency losses from duct leakage can be generated using our TECBLAST software. A theatrical fog machine can also be used to inject a non-toxic fog into the duct system to visually demonstrate the location and extent of air leakage



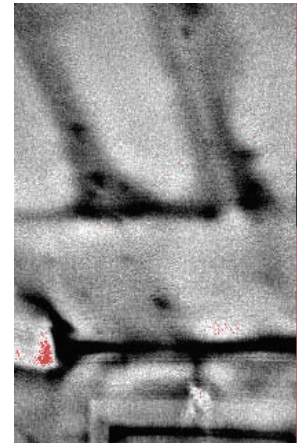
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Infrared Analysis

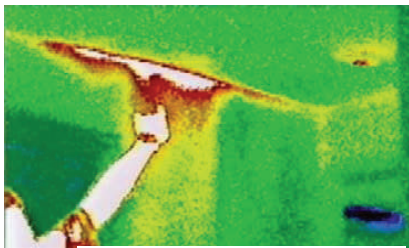
Infrared (IR) is a great way to solve building problems without doing destructive testing to a building. A problem such as moisture, missing insulation, or air movement is impacting on the performance of a building; IR can help solve this problem.



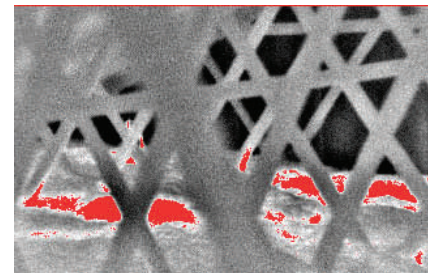
Nu-Wool's Technical Services Department has three cameras that are available to solve problems in the field. We use *Infrared Solutions IR-Insight* cameras that are very sensitive to small differences in temperature. These cameras can be used throughout the year they are able to "see" in a wall or ceiling without the great differences in outside and indoor temperatures typical of some cameras. Below are some actual IR photos from these cameras.



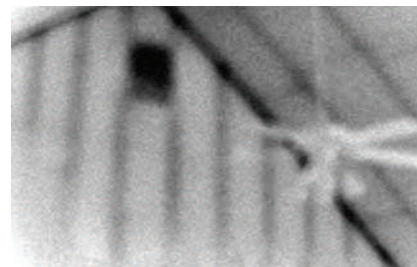
Poorly Installed Fiberglass Batt in Ceiling



Leak in Wall Duct



Leaking Ducts in Attic



Proper Wall and Ceiling Insulation

Guaranteed Energy Program

Nu-Wool, through Certified WALLSEAL Dealers, offers a Guaranteed Energy Program for new houses insulated with Nu-Wool Insulation, at no cost to the home owner or builder. This energy guarantee not only ensures savings on fuel bills, it can help home buyers add upgrades to their home without adding costs. Under this program, a home's heating and/or cooling bill is guaranteed for a period of three years. If the energy bills exceed the guaranteed amount, Nu-Wool will reimburse the home owner 50% of the overage. Builders can use this guarantee as an attractive selling feature to home buyers.

To apply for the Guaranteed Energy Program, simply have your insulation contractor complete the one-page form that describes the characteristics and insulation levels of your building. This form is returned to the Technical Services Department at Nu-Wool. Based on computer analysis using the Rem/Design program from Architectural Energy Corporation, it can be determined what your home should heat and cool for based on the reduction Nu-Wool adds to the efficiency of your home.



NU-WOOL Energy Guarantee Form											
Insulation Contractor _____	Fax: _____										
Homeowner or Job Name _____	Certificate needed? Yes No										
Address _____	City _____ State _____ Zip _____										
Only Nu-Wool insulation is used in this home _____ (signature required for Certificate)											
House	Square feet _____ sq. ft. <input type="checkbox"/> Include basement square feet										
	Volume _____ cu. ft. <input type="checkbox"/> Square feet x average wall height										
	Number of Stories _____										
Foundation	<table border="0"> <tr> <th>Basement or Crawlspace Foundation</th> <th>Slab Foundation</th> </tr> <tr> <td>Concrete wall insulation _____ R-value</td> <td>Slab Area _____ sq. ft.</td> </tr> <tr> <td>Wall Length _____ ft.</td> <td>Full perimeter _____ ft.</td> </tr> <tr> <td>Wall height above ground _____ ft.</td> <td>Edge of Slab _____ R-value</td> </tr> <tr> <td>Wall depth below ground _____ ft.</td> <td>Under Slab _____ R-value</td> </tr> </table>	Basement or Crawlspace Foundation	Slab Foundation	Concrete wall insulation _____ R-value	Slab Area _____ sq. ft.	Wall Length _____ ft.	Full perimeter _____ ft.	Wall height above ground _____ ft.	Edge of Slab _____ R-value	Wall depth below ground _____ ft.	Under Slab _____ R-value
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Wall depth below ground _____ ft.	Under Slab _____ R-value										
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Other _____ sq. ft.											
Windows & Doors	Window u-value _____										
	<table border="0"> <tr> <td>Window Area _____ sq. ft.</td> <td>Door Area _____ sq. ft.</td> </tr> <tr> <td>North _____ sq. ft.</td> <td>Door R-value _____</td> </tr> <tr> <td>East _____ sq. ft.</td> <td>Skylight u-value _____</td> </tr> <tr> <td>South _____ sq. ft.</td> <td>Skylight Area _____ sq. ft.</td> </tr> <tr> <td>West _____ sq. ft.</td> <td>Skylight Direction: North East South West</td> </tr> </table>	Window Area _____ sq. ft.	Door Area _____ sq. ft.	North _____ sq. ft.	Door R-value _____	East _____ sq. ft.	Skylight u-value _____	South _____ sq. ft.	Skylight Area _____ sq. ft.	West _____ sq. ft.	Skylight Direction: North East South West
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West _____ sq. ft.	Skylight Direction: North East South West										
Ceilings	Attic area _____ sq. ft.										
	Attic R-value _____										
	<table border="0"> <tr> <td>Nu-Wool cathedral 2x8 _____ sq. ft.</td> </tr> <tr> <td>Nu-Wool cathedral 2x10 _____ sq. ft.</td> </tr> <tr> <td>Nu-Wool cathedral 2x12 _____ sq. ft.</td> </tr> </table>	Nu-Wool cathedral 2x8 _____ sq. ft.	Nu-Wool cathedral 2x10 _____ sq. ft.	Nu-Wool cathedral 2x12 _____ sq. ft.							
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Nu-Wool cathedral 2x12 _____ sq. ft.											
Heating	Type: Furnace Boiler Heat Pump										
	Efficiency: 80% 90% Other _____										
	Fuel Type: Natural Gas Propane Oil Geothermal Air Source Electric										
	Fuel Price: \$ _____ or use state average price										
Cooling	Fireplace? Yes No										
	<table border="0"> <tr> <td>Efficiency: 10 SEER 12 SEER Other _____</td> </tr> <tr> <td>Electric Price: \$ _____ or use state average price</td> </tr> </table>	Efficiency: 10 SEER 12 SEER Other _____	Electric Price: \$ _____ or use state average price								
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Energy Guarantee Form

Insulation Contactor _____	Certificate Needed
Homeowners Name _____	Yes No
Job Address _____	
City _____ State _____ Zip _____	

General Information	
Square Ft. of Home _____ sq. ft.	Include basement square feet
Volume of Home _____ cu. Ft.	Square feet times average wall height
Number of Stories _____	Totally above grade

Basement or Crawlspace walls	Basement Floor / Slab
Concrete walls only (not walk out wall)	
Wall R-Value _____ R	Slab Area _____ sq.ft.
Wall Length _____ ft.	Full Perimeter _____ ft.
Height Above Grade _____ ft.	Exposed Perimeter _____ ft. on grade level
Depth Below Ground _____ ft.	Edge of Slab R-Value _____
	Under Slab R-Value _____

Frame Floors Over Garage, Crawlspace or Open air	
Area _____ sq. ft.	Area _____ sq. ft.
R-value _____	R-value _____
Location _____	Location _____

Rim Band / Box Sill	Doors
Area _____ sq. ft.	Area _____ sq. ft.
R-Value _____	R-value _____

Windows and Skylights		
U Value _____	SHGC Value _____	Roof Pitch ____/12
		Skylight area
North _____ sq. ft. area	Include sliders and french doors with windows.	North _____ sq. ft. area
East _____ sq. ft. area		East _____ sq. ft. area
South _____ sq. ft. area		South _____ sq. ft. area
West _____ sq. ft. area		West _____ sq. ft. area

Ceilings	
Attic Area _____ sq. ft.	Cathedral Area _____ sq.ft.
R-Value _____	R-Value _____

Exterior Walls include walk out walls here		
R-Value _____	R-Value _____	R-Value _____
Area _____ sq. ft.	Area _____ sq.ft.	Area _____ sq.ft

Heating Unit	Cooling unit
Equipment Type _____	Equipment Type _____
Efficiency _____	Efficiency _____
Location _____	Location _____
Duct Location _____	Duct Location _____
Duct Location _____	Duct Location _____
Duct R-Value _____	Duct R-Value _____
Fuel Cost Nat. Gas _____ CCF	Electric _____ KWH
Use State Average _____	
Oil/Propane _____ Gallon	
Yes _____	Yes _____



GUARANTEE FORM INSTRUCTIONS

House	<p>House square footage Volume</p> <p>Number of Stories</p>	<p>Add the square footage of all floors inside house including basement. <i>basement floor area X basement height = A</i> <i>first floor area X first floor height = B</i> A + B +C = Volume <i>second floor area X second floor height = C</i></p> <p>Number of Stories above ground level.</p>
Foundation	<p>Concrete wall insulation Length Height above ground Depth below ground</p> <p>Slab Area Full Perimeter Edge of Slab R-value Under Slab R-value</p>	<p>R-value of insulation applied to concrete walls - no walkout or daylight walls. The linear footage (length) of concrete basement walls. Height of basement wall exposed to daylight Height of basement wall in contact with soil</p> <p>Square footage of slab floor The length of all sides of the slab floor added together R-value of insulation installed around perimeter of slab floor R-value of insulation installed under slab floor</p>
Floors	<p>Basement Floor Area Full Floor Perimeter Exposed Perimeter Wood Frame Floor Area R-value</p>	<p>Square Footage of basement floor. The length of all sides of the basement floor added together The length of basement floor along a walkout wall Square footage of <i>living</i> area above garage, crawlspace, or outside. R-value of Floor Insulation 2x8 = R32 2x10 = R36 2x12 = R42</p>
Frame Walls	<p>Nu-Wool 2x4 Area Nu-Wool 2x6 Area Other R-Value Band & Rim Joist Area R-value</p>	<p>Total Square Footage of all 2x4 Nu-Wool side walls Total Square Footage of all 2x6 Nu-Wool side walls Used for wall insulation other than Nu-Wool 2x4 or 2x6 Square feet of exposed floor joists between floors R-value of Rim/Band Joist Insulation</p>
Windows & Doors	<p>u-value Area Door Area R-value Skylight u-value Area Direction</p>	<p>u-value is listed on window labels. Example u-values: Best .32 Good .38 Average .42 Poor .55 Total square footage of glass facing North, East, South, and West. Area of Doors without windows - doors with windows go under <i>Windows</i> R-value of doors - Example: R-2 to R-5 u-value is found on skylight stickers. Total square footage of skylights North, East, South, or West</p>
Ceilings	<p>Attic Area R-Value Cathedral Area R-Value</p>	<p>Square Footage of Attic Floors above living space R-Value of attic floors Square Footage of cathedral ceilings R-value of cathedral ceilings 2x8 = R32 2x10 = R36 2x12 = R42</p>
Heating	<p>Type Efficiency Fuel Type Fuel Price Fireplace?</p>	<p>Indicate the heating system type Check appropriate box for furnace efficiency Check appropriate box for fuel type Cost of Heating Fuel being used. Example: Natural Gas \$.75 per therm Does the home have a fireplace?</p>
Cooling	<p>Efficiency Electric Price</p>	<p>Efficiency of Air Conditioner or Heat Pump. Example: 10 SEER A/C Cost of Electricity. Example: \$.08 per kWh</p>