Insulation and Vapour Barriers

Description

Attic/roof spaces ❑ Fibreglass ❑ Cellulose ❑ Mineral wool ❑ Vermiculite ❑ Wood shavings ❑ Foam ❑ None

Approximate 'R' value _____

Basement/crawl spaces ❑ Fibreglass ❑ Foam ❑ Partially insulated ❑ Not visible ❑ None

Approximate 'R' value _____

Vapour/air barriers ❑ Plastic ❑ Kraft paper ❑ Not visible ❑ None

Attic ventilation ❑ Roof ❑ Ridge ❑ Soffit ❑ Gable ❑ Fascia ❑ Interior soffit vents

Crawl space ventilation ❑ Wall ❑ Into basement ❑ None

Mechanical ventilation ❑ Power ❑ HRV ❑ Other _____

Limitations

Insulation/vapour barrier inspection limited by ❑ Storage in basement/crawl spaces/attic
❑ Limited/no access to attic/roof spaces/crawl space/knee wall areas/floor spaces ❑ No attic hatch found
❑ Attic hatch sealed shut ❑ Attic hatch obstructed by fixed shelving/storage ☑ Area of ventilation not measured
☑ Ventilation from soffits into attic not confirmed ❑ Vapour barrier covered by insulation

No access to ☑Wall spaces/cathedral ceilings/areas hidden by storage

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Recommendations and Notes

Attic/roof space.....

Insulation ❑ Wet ❑ Voids ❑ Compacted ❑ Upgrade recommended ❑ Vermin debris/damage
❑ Storage compressing insulation - remove and store elsewhere ❑ Vermiculite - possible asbestos hazard
❑ Wood shavings - fire hazard

Ventilation ❑ Inadequate - increase ❑ Obstructed by insulation ❑ Mildew/rot to sheathing/planks
❑ Ice on inside of roof ❑ Soffit baffles damaged/missing

Vapour barrier ❑ Wrong place ❑ Missing ❑ Damage ❑ Not visible

Access hatch ❑ Increase hatch cover insulation ❑ Poor fit ❑ Poor access/location ❑ Provide attic access

Walls.....

Insulation ❑ Missing ❑ Damage ❑ Wet ❑ Not visible

Vapour barrier ❑ Wrong place ❑ Missing ❑ Damage ❑ Not visible

Basement/crawl space(s).....

Insulation ❑ Not visible ❑ Wet ❑ Falling ❑ Incomplete ❑ Damage ❑ Missing at rim joists
❑ Exposed foam insulation - possible fire hazard - cover with drywall or remove
❑ Absense of insulation in unfinished spaces

Insulation & Vapour Barriers (2)

Vapour barrier ❑ Wrong place ❑ Missing ❑ Damage ❑ Not visible
❑ Cover dirt/exposed floors with vapour barrier to reduce moisture at adjacent living spaces

Ventilation ❑ Inadequate - increase ❑ Obstructed ❑ Mildew/dampness/stains
❑ Increase ventilation to cold storage areas

Additional Notes

Read this.....

Insulation is subject to the "Law of Diminishing Returns" which dictates that "more' is not necessarily "better". In many cases if you add more insulation, you'll make only a small difference to heat loss and it will therefore, be many years before you recover the capital cost.

In basements and crawl spaces, be sure that insulation is at least three or four inches above floor level. Then if there's a flood, it's likely that the insulation will stay dry.

Exposed foam insulation can be a significant fire and smoke hazard and should be removed or covered with a fire resistant material (drywall for instance).

Poor ventilation in attics, basements and crawl spaces is a major cause of moisture damage to framing, trusses, drywall and sheathing. It is also a significant factor in the production of molds and mildew.

Poor insulation - especially at roof to exterior wall edges - is a major contributor to ice damming.

Insulation and vapour barriers (3)

What is 'R' value anyway?

The effectiveness of a building assembly such as an exterior wall or attic ceiling in resisting the flow of heat is measured as it's thermal resistance - R value or RSI value.

'R' value is the number that you get when you test an insulation material's resistance to heat transfer across its width - in no air movement at 70 degrees Fahrenheit. For instance an inch of glass fibre with give you a number about 3.4.

Using this information we can now see that if we put six inches of glass fibre in a wall - we'll get an 'R' value of about 20. (6 x 3.4 = 20.4). Different insulation materials have different R values - settled, blown in, cellulose for instance has an R value of about 3.7 per inch, expanded polystyrene is about 4.0 per inch and so on.

Of course we can not usually replicate the testing conditions in the real world - so although the insulation in your attic may be declared as R40 - the likelihood is that given the surrounding conditions - it's something less than that.

Making any insulation wet or allowing any air movement (between poorly installed batts for instance) - reduces its effective R value significantly.

Years ago when fuel was cheap - or often in the case of wood - free - there was less concern about insulating our homes than what is the requirement today

As oil prices increase the impact of rising fuel costs, insulation values become an important part of controlling energy costs. Clearly - whether you live in a hot or cold area of the country - insulation will be a major factor in reducing your heating or cooling costs. (All figures in US dollars).

Most modern homes have adequate insulation and it's one area where the "more is better' maxim doesn't necessarily apply.

Should I add more?

Insulation heat resistance levels are subject to the Law of Diminishing Returns.

Suppose you have an uninsulated home and you add $1,000 worth of insulation - you might save $200 on your heating or cooling costs. Now you add another $1,000 dollars of insulation and to your horror you discover you only saved $225.

How could this be? - well the first $1,000 saved you 75% of your heat loss but the second $1,000 only saved you 75% **of the 25%** you didn't save in the first place!

So be careful about adding lots more insulation - often it will be many years before you recoup the capital cost by way of heating or cooling loss saving.

Your home inspector will have a good idea of the value of your current insulation and will advise you about the benefits of upgrading.

Foam insulation

Foam insulation - often known generically as Styrofoam - is widely used as an insulator for walls, floors and (less commonly) ceilings. Do not confuse modern spray foams with UFFI - Urea Formaldehyde Foam Insulation.

Insulation and vapour barriers (4)

Most installations in habitable areas must be covered by some fire resistant material. Often drywall is adequate.

Any exposed foam insulation can be a fire hazard and when burning may give off a thick toxic smoke. We recommend that all exposed foam insulation be removed and replaced with a different insulation or covered with a fire resistant material.

Ventilation

Two mechanisms tend to drive water vapour through the building shell vapour pressure and air movement. Ventilation of attics, crawl spaces and other largely uninhabited areas is an important factor in the reduction of dampness, humidity and rot. Damp, airless places often encourage mold, mildew and other problems.

Poor or inadequate ventilation can be a contributory factor to rotting wood products and rust on oil and water storage tanks.

Vapour barriers

Vapour barriers are most commonly kraft paper, polyethylene or incorporated into the insulation material. (Styrofoam for instance).

Vapour barriers must always be on the warm side of the insulation - so if you're standing inside your home - the sequence of materials in the wall would be:

Paint (or wallpaper)
Drywall (or plaster)

Vapour barrier

Insulation
Wall sheathing
Tar paper/Air barrier etc.
Exterior veneer - bricks or vinyl for instance

We also use vapour barriers to protect wood products from moisture. One of the most common areas is where wood framing is installed on concrete floors, especially in basements, and exterior building walls. All newer homes should have a vapour barrier under the bottom plate of the wall where it is in contact with the cement floor. In some areas, preserved wood or cedar (which has natural oils to prevent decay) may be acceptable.

Vermiculite insulation may have asbestos content. We recommend that where this material is found, a sample be laboratory tested and where necessary professionally removed.
Urea Formaldehyde Foam Insulation (UFFI) was used in many homes, mainly as a wall insulation. In many jurisdictions it is now considered to be inert. It is no longer used in residential applications.

The inspection

In most cases the inspection of attic or knee wall areas will be carried out from the access hatch. Many insulation materials are a health hazard if inhaled and moving about in these spaces can compress the existing materials - reducing its effectiveness. Entering these spaces will always be in the inspector's absolute discretion.

Generally speaking, wall insulation is not visible. However uninsulated foundation walls are a major source of heat loss, particularly in older homes.