



Builder Guide



DESCRIPTION

Insulation is a key ingredient for a comfortable and energy efficient house. Insulation materials available include batt-type, loose fill, boardstock, spray-type, and radiant barriers. While most houses today are built with a basic level of insulation, that level can often be increased cost-effectively in walls, attics, basements and crawl spaces.

It is important to provide a continuous boundary of insulation along the building envelope. Areas that are often overlooked when insulating include: headers, corners and wall intersections (see “Advanced Wall Insulation Techniques” fact sheet). Other insulation areas of concern include: insulating attics at the eaves, floors over garages, and rim joists (see “Advanced Floor and Ceiling Insulation Techniques” fact sheet). These topics can also be found in the references listed on the back.



BENEFITS

When providing a comfortable, energy efficient house with increased levels of insulation look for increased customer satisfaction, reduced callbacks, and increased referrals. Providing a potential home buyer with a more desirable product can increase business and profits.

Increased insulation improves comfort.

Insulation slows the rate of heat flow from a warmer to a cooler area. This results in warmer walls in winter and cooler walls in summer, for greater comfort.

Improve Energy Efficiency with Increased Insulation

Increased levels of insulation also provide more even temperatures throughout the house.

Typical vs. Cost Effective Insulation Levels for Moderate Climates

Building Component	Model Energy Code	May be Cost-Effective
Attic	R-30	R-38
Exterior Walls	R-13	R-19
Floors (over garage)	R-19	R-30
Basement Walls (above grade)	R-8	R-11
Ducts	R-6	R-8

Increased insulation reduces energy use.

Increased insulation levels reduces energy use for heating and cooling. Lower energy use results in lower energy bills, making the home less expensive to operate and more attractive to the buyer.

Increased insulation reduces condensation on basement walls.

Moisture problems in a basement can often lead to mold and mildew build-up and make storage in the basement impractical. Increased insulation levels can reduce condensation, resulting in a drier basement and fewer moisture based problems.

Increased insulation increases noise dampening.

Increased levels of insulation help keep out unwanted noise from the outside. This produces quieter, higher quality homes.

Increased insulation can result in better quality construction.

In some cases, standard 2x4 constructed walls can be replaced with 2x6 walls. This enables even higher levels of insulation to be placed in the walls, enhancing all of the above benefits. The thicker walls visible to your home buyers can be used to promote higher quality construction.



INTEGRATION

Insulation must be installed properly.

To reap the benefits of increased insulation, it must be installed properly. The insulated space must be completely filled with the material - there must be no gaps or voids. Make sure that no hidden corners or spaces around headers are missed. Make sure insulation is carefully shaped around wiring, electrical boxes, or pipes. In addition, insulation should not be compressed as it is installed. Loose fill and wet spray insulations must be installed according to design specifications if they are to perform as expected.

Insulation must be kept dry.

Insulation must be kept dry to perform properly. In cold climates, also install a vapor retarder on the warm side of the insulation and/or use low-perm paint to prevent moisture from degrading insulation performance.

Coordinate with subcontractors.

Because the various parts of a house work together as a system, it is important for all subcontractors to work closely with each other - especially with the insulation contractors. All holes made through the insulated building envelope must be sealed. An excellent strategy is to minimize the number of places where wires, conduits, supply cables, electrical receptacles, and electrical devices must penetrate the air barrier.

Roof framing with unheated attics.

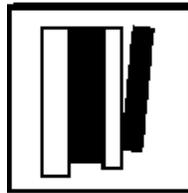
One of the biggest problem areas in most insulated ceilings is at the eaves where conventional roof

trusses or rafters do not permit full-thickness insulation. Inadequate insulation and blocked soffit vents can cause condensation and mold at cold

Thermal Values for Insulation Materials

Insulation Material	R-Value per Inch
Batt-type	3.1 - 3.5
Loose Fills	2.9 - 3.7
Board stock	3.5 - 6.2
Spray-Type	3.5 - 6.0

corners. Not allowing enough room for roof venting can also cause moisture problems in the roof system. Advanced roof framing techniques can solve the problem. See "Advanced Floor and Ceiling Insulation Techniques" fact sheet for details.



RESOURCES

- Super Good Cents Builder's Field Guide* (Bonneville Power Association), 1992. Available at 206-216-4272.
- NY Star Builder's Field Guide* (NY Star, Inc.), 1994. Available at 518-465-3115.
- Energy Efficient Florida Home Building* (Florida Solar Energy Center), 1992. Available at 407-638-1000.
- Canadian Home Builder's Association Builder's Manual*, 1994. Available at 1-800-346-0104.
- Moisture Control Handbook: Principles and Practices for Residential and Small Commercial Buildings* (Lstiburek and Carmody), 1993. Available at 1-800-346-0104.