Louisville Climate Action Network

# Top Tips on Insulation

Insulating your home or business pays long-term dividends: You'll cut your utility costs, be warmer in winter and cooler in summer, enjoy quieter quarters and reduce your carbon footprint. LCAN offers the following experienced-based tips:

1. **Understand building science.** While the Pink Panther has stressed R-factors—the resistance to heat transfer through solids, the higher, the better—modern building science tells us we should focus on blocking the flow of air, as it carries heat and moisture. Inside buildings, heat rises within occupied space and walls. That air movement is called the "stack effect." Aim to block it.

2. **Understand how your building was constructed to ensure proper installation, without creating moisture problems.** Most local homes and many businesses have "stick construction," i.e., framed of wood or metal studding. Some 19th Century homes and businesses are "solid brick" and lack studs. Early stick construction used "balloon framing;" most 20th Century and newer stick construction has bottom (or sill) and top "plates."

3. **Be strategic.**[i] No one has unlimited funds to invest. Even if spry enough to explore your attic or crawlspace, you can't see into walls or other closed cavities. Hire a qualified contractor to conduct a high-tech energy audit, including a blower-door (infiltrometer) and infrared (IR) photography. The audit report should itemize deficiencies and suggest corrections, illustrated with clarifying photos, if not recommend local contractors. Consider hiring the auditor, too, to quantify how much your HVAC ducts leak, test for incomplete gas combustion and check for a clogged water heater vent pipe.

4. **First, weatherize.** Insulation won't help much if there are gaps around doors or windows, or open penetrations through the foundation or walls. See https://www.louisvillecan.org/weatherizing for more tips.

5. **Then, insulate the rim boards and attic.** When done properly, most property owners conclude they don't need to insulate their walls. Insulating an existing building's walls requires costly demolition and restoration, so do so if you're still uncomfortable. If you like the look of stucco, using shotcrete—cement sprayed onto thick PS board—to "outsulate" may be more practical.

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6. **Choose water-based spray foam insulation if you can afford it.** Foam isn't a do-it-yourself (DIY) product, but stop air flow and performs best. Code requires your installer to spray a fire retardant on top of foam containing cyanurates. Alternately, choose foam made from vegetable oil. Consider insulating the underside of the roof rather than the attic floor IF you can eliminate all attic vents.[ii, iii] Since it'd leave the attic semi-conditioned and dry, stored items are much less vulnerable to temperature swings and mildew.

7. **Or use rigid polystyrene (PS) board, fiberglass bats or loose fill and/or blown-in cellulose.** These products can be DIY projects, but review the manufacturer's on-line written and video instructions to ensure you buy the right quantity and avoid installation errors. Extruded PS is better than expanded. If you hire a contractor to blow in fiberglass or cellulose, contract to withhold 50% payment until three weeks after installation. Pay only if you measure the contracted depth after that settling period.

8. **When seeking bids, share this information with contractors:**

    a. Your goals, such as, fixing cold or hot spots within the building, finishing under-used space and/or reducing your utility bills/carbon footprint.
    b. High-tech energy audit reports from an energy auditor, LG&E or your HVAC contractor. Note any improvements you've since made.
    c. How soon you expect to replace your roof.[iv]

For more information, please visit https://www.louisvillecan.org/insulation

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[i] If you'll need new HVAC equipment soon, insulate first, lest you end up with oversized HVAC.

[ii] Ideally, prior to insulating, have your roofer remove all roof vents and patch their openings. Louvered vents may remain if done correctly: to maintain architectural appearance and protect against birds and squirrels, cover them on the inside with dark-colored "coil" aluminum—color facing outwards—as is used to make gutters, clad windows, etc. Ask your foam-insulation contractor to spray right over the aluminum.

[iii] Many roofers incorrectly believe eliminating attic vents and/or insulating the underside of the roof will void the roofing warranty. If you ask where it's written in the warranty, they can't show you, because it's not true. If still in doubt, call the manufacturer.

[iv] Depending on how complicated your architecture is, the best, least-cost approach may be removing the old roofing and strategic sheeting, insulating and replacing the sheeting and roofing.