

Types of Insulation (from U.S. Dept. of Energy website)

Form	Insulation materials	Where applicable	Installation Method(s)	Advantages
Blanket: batts and rolls	Fiberglass. Mineral (rock/slag) wool. Plastic fibers. Natural fibers.	Unfinished walls, including foundation walls, and floors and ceilings.	Fitted between studs, joists, and beams.	Do-it-yourself. Suited for standard stud and joist spacing, which is relatively free from obstructions.
Concrete block insulation	Foam beads or liquid foam: * Polystyrene * Polyisocyanurate/polyiso * Polyurethane Vermiculite or perlite pellets	Unfinished walls, including foundation walls, for new construction or major renovations.	Involves masonry skills.	Autoclaved aerated concrete and autoclaved cellular concrete masonry units have 10 times the insulating value of conventional concrete.
Foam board or rigid foam	Polystyrene. Polyisocyanurate or polyiso. Polyurethane.	Unfinished walls, including foundation walls; floors and ceilings; unvented low-slope roofs.	Interior applications must be covered with 1/2" gypsum board or other approved material for fire safety. Exterior applications must be covered with weatherproof facing.	High insulating value for relatively little thickness. Can block thermal short circuits when installed continuously over frames or joists.
Insulating concrete forms (ICFs)	Foam boards or foam blocks.	Unfinished walls, including foundation walls, for new construction.	Installed as part of the building structure.	Insulation is literally built into the home's walls, creating high thermal resistance.
Loose-fill	Cellulose. Fiberglass. Mineral (rock/slag) wool.	Enclosed existing wall or open new wall cavities; unfinished attic floors; hard-to-reach places.	Blown into place using special equipment; sometimes poured in.	Good for adding insulation to existing finished areas, irregularly shaped areas, and around obstructions.
Reflective system	Foil-faced kraft paper, plastic film, polyethylene bubbles, or cardboard.	Unfinished walls, ceilings, and floors.	Foils, films, or papers; fitted between wood-frame studs, joists, and beams.	Do-it-yourself. For framing at standard spacing. Bubble-form suitable for irregular framing or obstructions. Most effective at preventing downward heat flow; effectiveness depends on spacing.
Rigid fibrous or fiber insulation	Fiberglass. Mineral (rock/slag) wool.	Ducts in unconditioned spaces; can withstand high temperatures.	HVAC contractors fabricate the insulation into ducts either at their shops or at the job sites.	Can withstand high temperatures.
Sprayed foam and foamed-in-place	Cementitious. Phenolic. Polyisocyanurate. Polyurethane.	Enclosed existing wall or open new wall cavities; unfinished attic floors.	Applied using small spray containers or in larger quantities as a pressure sprayed (foamed-in-place) product.	Good for adding insulation to existing finished areas, irregularly shaped areas, and around obstructions.
Structural insulated panels (SIPs)	Foam board or liquid foam insulation core. Straw core insulation.	Unfinished walls, ceilings, floors, and roofs for new construction.	Builders connect them together to construct a house.	Superior, uniform insulation compared to traditional construction methods; also take less time to build.

Summary of Insulation Options for Autrey Mill

Blanket forms (batts and rolls) are not good, because they cannot be applied to a finished house, without taking down the wall.

Concrete block insulation is not good because it cannot be put on a building more than 1 story high, without proper support; because the building would collapse.

Foam board or rigid foam is not O.K. because, it is for unfinished houses.

ICFs is not good because it is for unfinished houses.

Loose fill is good for adding insulation to existing finished areas, irregularly shaped areas, and around obstructions, but you need special equipment to apply it.

Reflective system is not O.K. because it is for unfinished areas.

Rigid fibrous or fiber insulation is good because it can resist high temperatures, and the room this is applied to is on the second story. Heat rises and it only has one place to go; the second story room. It is constantly hot up there so for this room, this type of insulation is ideal.

Sprayed in foam is very good, because it's form causes it to be easy to apply, and it is good for odd-shaped areas.

SIP's are not good because they are for unfinished areas.