# BASEMENT INSULATION

12A

Basements can account for 20 to 35% of the heat loss in a house. A “stack” or “chimney” effect is created when cold air enters from the lower portion of the house and warm air is forced out through the top portion of the house.

***An insulated basement wall presents a limitation during a visual inspection. It is difficult to fully inspect and determine if any moisture causing defects exist behind the insulation and finish material.***

**BATT/BLANKET**

The two common types are fiberglass and mineral wool (rock wool) which comes in batts or continuous rolls. *Note that* the backing paper on batts acts as a vapor barrier and must be placed on the warm side of the wall.

**LOOSE FILL**

This insulation can be made from a variety of materials, with texture ranging from fluffy to granular and can be poured or sprayed into place. This type of insulation is not appropriate for below grade applications.

- **Cellulose** made from shredded newsprint treated with chemicals that resist fire and fungal growth
- **Mineral (Rock) Wool** is similar to fiberglass in appearance and texture, but is treated with oil and binders to suppress dust, keep its shape and make it non-combustible
- **Fiberglass** is similar to batts but is chopped up – it may be difficult to install in wall cavities that are partially blocked
- **Vermiculite**, an expanded mica material, can be untreated (absorbs moisture) and treated (water-repellant) with asphalt; with vertical applications, the material is packed down with a heavy weight to prevent future settling

**RIGID BOARDS**

All board types have a higher insulating value per unit thickness, but the cost is greater. The boards are lightweight and easy to cut, but may be difficult to install in irregular spaces.

- **Fiberglass** (high-density, semi-rigid) boards come in two types. One is designed for below-grade applications and the other is for above-grade exterior sheathing.
- **Extruded Polystyrene** is a foam plastic board with fine, closed cells containing a mixture of air and fluorocarbons. If joints are sealed properly, it can perform as an air barrier and as a vapor barrier.
- **Expanded Polystyrene** is resistant to moisture and can be used on the exterior of foundation walls.

**SPRAY FOAM**

- **Urethane** is a rigid foam containing fluorocarbons and should not be used in enclosed cavities
- **Icynene** is sprayed directly onto the surface or poured into enclosed cavities and expands in place and sets in seconds – it acts as both an air and vapor barrier

***Note:*** *In most jurisdictions it is necessary to place a layer of fire resistance material (gypsum board) over any insulation to reduce harmful gases being emitted in the event of a fire. Check with you local building codes and/or fire department.*

***FOUNDATION TYPES AND INSULATION:***

**OLDER FOUNDATIONS** (rubble, stone, and brick) – have a history of moisture problems and should be insulated from the outside.

**CONCRETE FOUNDATIONS** – can be insulated from the inside or outside as long there are no serious water or structural problems.

**PRESERVED WOOD FOUNDATIONS** – are made with treated wood studs and sheathing and are generally fully insulated.

**CRAWL SPACES** – the walls of a crawl space can be insulated from the outside or inside, or the floors above the crawlspace could be insulated; *ventilation should be at the ratio of 1 to 500 (vent area to floor area) and the floor must be covered with a moisture barrier (polyethylene).*

**SLAB ON GRADE** – insulated like a full basement, but the closer the footing is to the surface, the longer the horizontal rigid board insulation should be around the perimeter.



INSERTED WITH REPORT #

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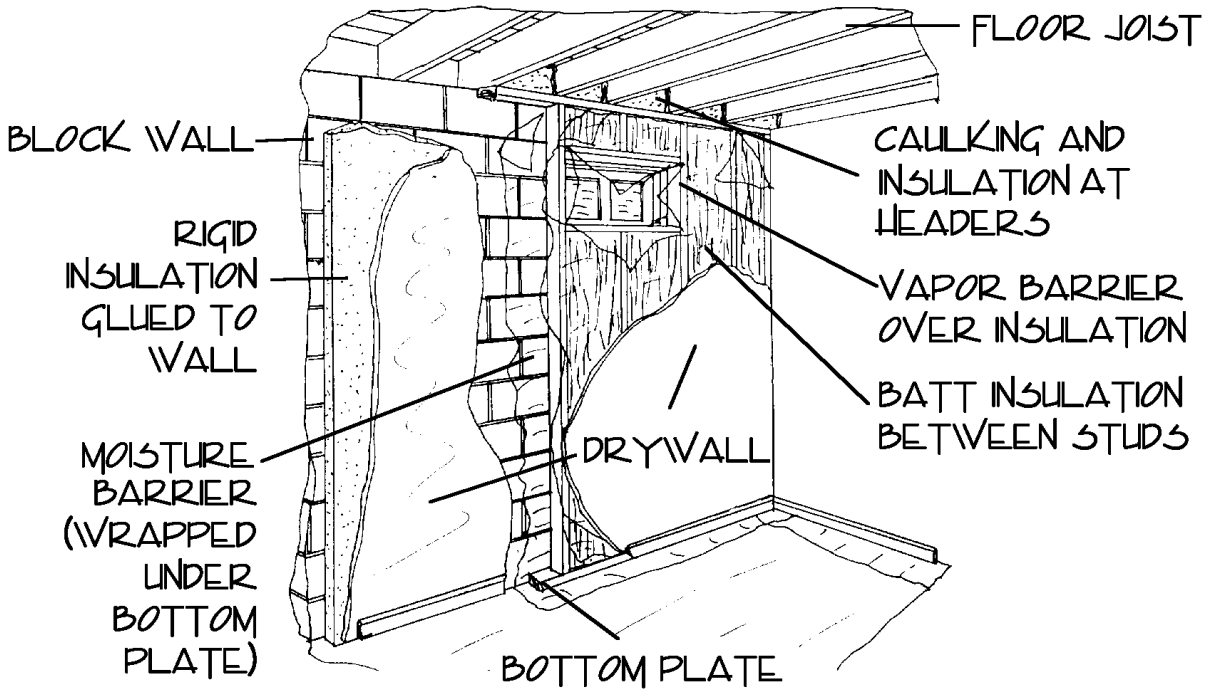
## Insulation Ratings

| | R-NUMBER | | | | | |
|---|---|---|---|---|---|---|
| **INSULATION TYPE** | **11** | **13** | **19** | **22** | **30** | **38** |
| ***Batts/Blankets*** | | | | | | |
| Mineral (Rock) Wool | 3 | 4 | 5½ | 6 | 8½ | 11 |
| Fiberglass | 3½ | 4 | 6 | 7 | 9½ | 12 |
| ***Loose-fill*** | | | | | | |
| Cellulose | 3 | 3½ | 5½ | 6 | 8½ | 11 |
| Mineral (Rock) Wool | 4 | 4½ | 6½ | 8 | 10½ | 13 |
| Fiberglass | 5 | 5½ | 8½ | 10 | 13½ | 17 |
| Vermiculite | 5 | 6 | 9 | 10 | 14 | 18 |
| ***Rigid Board*** | | | | | | |
| Fiberglass | 3 | 3½ | 5 | 5½ | 7½ | 9½ |
| Extruded Polystyrene | 3 | 3½ | 5 | 5½ | 7½ | 9½ |
| Expanded Polystyrene | 3 | 3½ | 5½ | 6 | 8½ | |
| ***Foam-in-place*** | | | | | | |
| Urethane | 2 | 2 | 3 | 3½ | 5 | 6 |
| Icynene | 3 | 4 | 5 | 6½ | 8½ | 10½ |

(*thickness in inches)* *R-numbers are additive; an insulation rated at R-11 added to one*




**TYPICAL INSTALLATION OF INSULATION ON A BASEMENT FOUNDATION WALL**