It's no secret that adobe is an excellent sustainable building material. Due to its **high thermal mass**, adobe has high thermal capacitance and **absorbs and stores heat to regulate indoor temperatures**.

However, it's worth noting that adobe insulation is essential because materials with high thermal capacitance are poor insulators.

So, why do adobe houses need insulation? As with any other home, insulating adobe walls helps **lower your heating and cooling costs**.

According to Energy Saver, insulation enhances resistance against heat flow through the walls, making the indoor environment comfortable without relying on central heating and cooling.

In the rest of this article, I'll discuss adobe insulation for better indoor comfort. You can identify the most effective adobe home insulation by exploring the different methods for insulating adobe walls. Let's get started!

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Creating a Double Wall System

A mixture of straw and clay is held in position with chicken wire to create an outer insulating wall on an adobe house. Image courtesy of VISIONCREATIONADOBE.

A double wall system has been used to build energy-efficient homes for a long time.

The basic principle of this system is to build a structural interior wall (in this case, adobe wall) and an exterior wall made of **high insulation value fiber mix**, such as hemp or straw clay.

According to the Cold Climate Housing Research Center, a double wall for insulation is suitable for most earthen houses because **it prevents moisture problems that can arise from using vapor-impermeable** insulations.

Here is how to incorporate a double wall system into your adobe house for insulation:

1. Build an interior structural wall out of adobe brick.
2. Build an exterior wall 9-16 inches (23-41 cm) away from the interior wall, using a mix of high insulation value fibers (hemp or straw clay).
3. Fill the gap between the walls with insulation material such as volcanic pumice, vermiculite, straw, hemp, or sheep's wool.
4. Seal the gap with clay plaster for optimal airtightness and moisture control.

Using this method, you can achieve an impressive R-value of up to 17 – far better than what is achievable with regular earthen building techniques. This is an excellent way to increase your adobe brick insulation value.

Using Rigid Polystyrene Insulation

Rigid polystyrene insulation is attached to an adobe wall using blobs of adhesive and plastic cap nails.

Rigid polystyrene is among the best options for adobe insulation because it's permeable. Therefore, **it prevents moisture accumulation within the adobe walls by facilitating breathability**.

Moreover, this insulation is easy to install as it only involves nailing around the walls.

Extruded polystyrene (XPS) foam has a tongue and groove connection for easy installation, higher insulation value, and air tightness. These foam

boards have **an R-value of 5 per inch of thickness**, making them excellent for adobe homes.

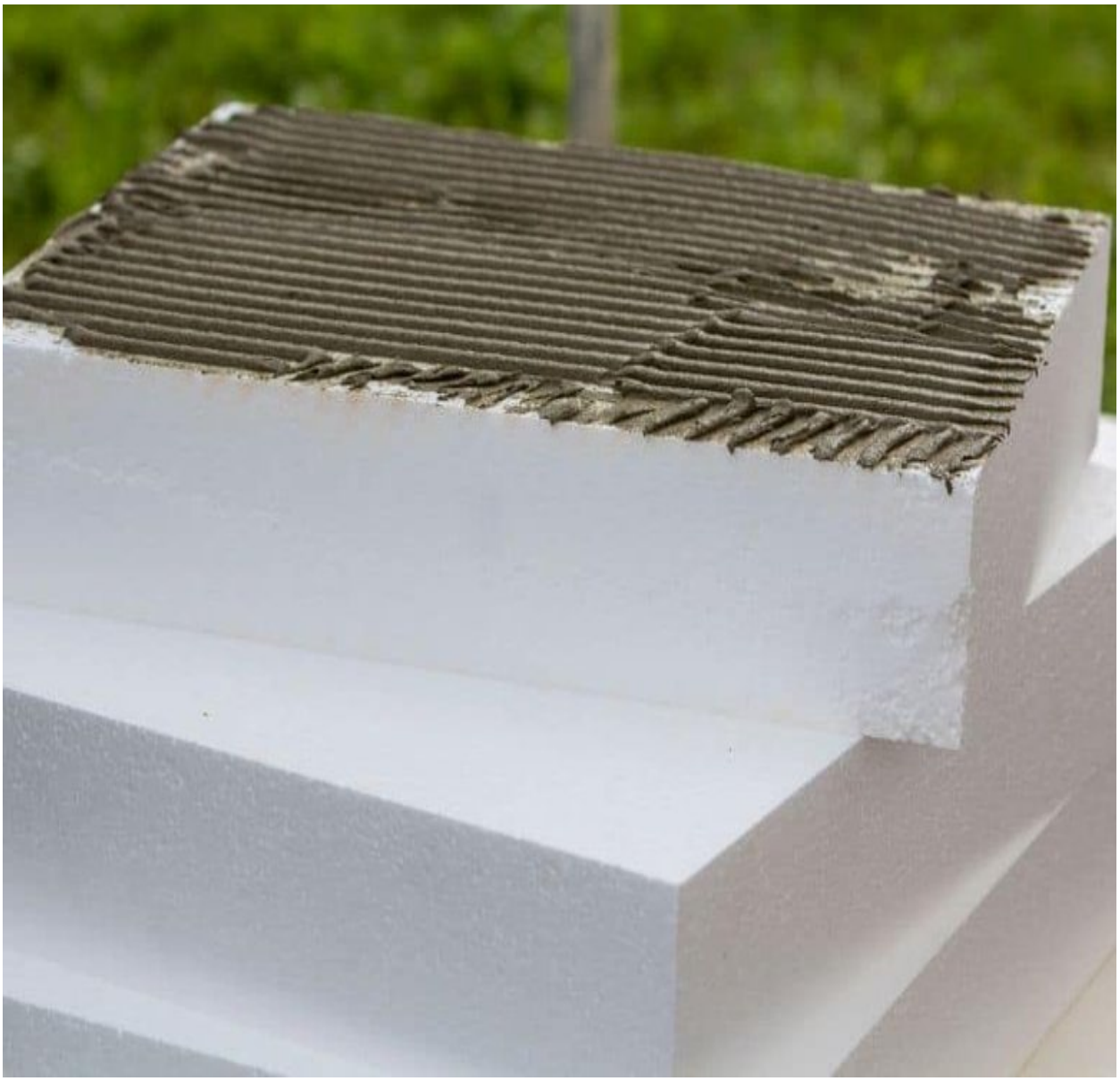
Once you have your rigid polystyrene insulation, nail it over the adobe wall using 3/8-inch head galvanized roofing nails.

You can also use plastic cap nails or 16-gauge staples to attach the panels to the walls. Space the fasteners at least 24 inches (61 cm) apart for a secure connection along the studs.

Trim the panels to fit around windows and doors using a utility knife or handsaw.

Lastly, you'll need to seal the seams between the panels and around the windows for improved insulation. You should **use special tape to seal joints and not caulk**. Caulk may hold water against the walls instead of allowing it to drain away.

Installing Rigid Polyurethane Insulation



Blocks of rigid polyurethane insulation are fixed to the adobe wall with adhesive.
Like polystyrene, rigid polyurethane is a permeable insulator that facilitates breathability and prevents moisture build-up inside the walls.

Rigid polyurethane foam has **an R-value of 6 to 6.5 per inch**, making it an excellent option for adobe homes. It's also lightweight, easy to install, and relatively inexpensive ($1.00 to 1.50 per board foot) compared to other forms of insulation.

Here is the installation procedure:

1. **Dry the wall:** Make sure the wall is dry before installing the insulation. Installing rigid polyurethane insulation to wet walls or studs increases the risk of unwanted contaminants. You can use floor fans to dry all moisture from the surface.
2. **Measure and cut the foam boards:** Measure the walls and cut the foam boards accordingly.
3. **Attach the foam:** Use 3/8″ head galvanized roofing nails, screws, or adhesive to attach the polyurethane foam board to the walls. Screws and nails are suitable if you have sufficient studs along the walls. If you use adhesive, add it immediately to the back of the cut boards and stick them onto the walls.
4. **Seal the edges:** Use a comprehensive foam sealant like the *MAGZO Adhesive Foam Stripping* to close all cracks and seams around the insulation boards, window, and door frames. This will help avoid any energy loss from air infiltration.

Expert advice: To improve airtightness and avoid any gaps between two panels, you should overlap them by 1 inch (2.54 cm). Furthermore, if you use an adhesive, lean 2 x 4s (0.6 x 1.2 m) against each insulation board as it dries. Most adhesives dry within 30 minutes or, at most, 24 hours.

Use Loose-Fill Insulation for the Roof

Loose-fill insulation such as fiberglass or cellulose does a good job adding thermal insulation to your roof.
All along, we've been discussing wall insulation; what about adobe roof insulation?

Loose-fill insulation comes in handy for the roof because it's made of **tiny particles that can conform to any space without disorienting structures and finishes**.

Areas like the attic, crawl space, and between the roof deck and ceiling are excellent candidates for this insulation.

Loose-fill insulation has an R-value of 2.2 to 3.8 per inch, depending on the type. This is suitable for insulating your adobe home's roof.

Loose-fill fiberglass or cellulose are the most popular products for adobe roof insulation.

You should prepare your attic adequately before blowing the insulation. **Pay close attention to hot objects** like HVAC venting, lighting, and other house systems to avoid fire risk. Use special measures to protect these areas from direct contact with the loose-fill insulation.

For instance, you can fit protective covers to light fittings to prevent direct contact with the loose-fill insulation.

Lastly, use polyurethane foam or cellulose spray-in between the joists and rafters for improved attic insulation.

We recommend wearing protective gear like a face mask to avoid inhaling dangerous particulates or fumes when blowing the insulation.

Besides loose-fill insulation, you can use cork insulation for the roof. This simply involves hammering cork boards onto the roof slats.

Frequently Asked Questions

You'll find the answers to some common questions relating to adobe construction and insulation in the section below.

Do Adobe Houses Need Insulation?

Adobe houses need insulation because adobe is a poor insulator. Insulating your adobe house increases its resistance to heat flow, reducing your demand for heating and cooling to make the indoors comfortable.

Are Adobe Houses Warm in Winter?

Adobe houses are warm in winter, especially in hot climates. Due to their high thermal mass, adobe bricks absorb heat from the sun, which they then radiate into the house, warming the interior.

What Is the R-Value of an Adobe House?

The R-value of an adobe house is between 0.2 to 0.3 per inch. Therefore, since most adobe walls are 10 inches (25.4 cm), the R-values range between R-2 and R-3.

Do Adobe Houses Stay Cooler?

Adobe houses stay cooler due to the material's high thermal mass that absorbs heat during the day to cool the house.

Final Thoughts On Adobe Insulation

Installing adobe insulation is an essential step in maintaining a comfortable home temperature year-round. The key is to choose the right insulation for your specific needs and install it properly.

Whether it's rigid polyurethane, fiberglass batting, or loose-fill insulation, using the right materials and installation technique will ensure your adobe home is optimally insulated.