

Superinsulated Houses: Cheaper Fuel, Cozier Folk

Reprinted from TCC N/L The Council, May 1980

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"Alaska's traditional houses before non-Native contact were designed of large logs buried in the ground covered with an 18-inch coat of dirt. Original people of Alaska, in essence, built the first superinsulated houses."
— Bob Roggasch

A self educated man who built the first superinsulated houses in Fairbanks, Bob Roggasch, learns from talking with people and from experience. He has lived in Fairbanks since 1967, and has taught Passive Solar Heating and Energy Conservation at the Tanana Valley Community College. He is on the Governor's Advisory Board on Solar Energy.

Q: Why is it so important for people in the villages to start thinking about superinsulated homes?

Roggasch: They are cheaper to live in, and before the 1900's the ancestors of the people in this area were wise to live in a form of superinsulated home.

Q: How can we make our homes superinsulated?

Roggasch: Today people live in wood frame houses that are constructed of 2x4's or 2x6's or in log houses. The log house has a great deal of thermal mass, which keeps the heat in. The heat is also retained in the logs when the stove goes off; making for a warm and comfortable house though not necessarily energy efficient, and does not have the heat-retaining qualities of the log. More energy efficient are the 2x6's, but they still lack the comfort and warmth of the log, again lack of thermal mass.

What I have done is to build a wall using mass material and going back to the principle of the 18 inches of dirt — or today we use fiberglass or cellulose. Then we point the house to the south with windows that would make it a passive solar gain house, so the sunlight will help heat the house through the window. Which brings us back to the basic traditional house as far as thermal resistance to heat and cold.

Q: What would it cost to heat a superinsulated house per year?

Roggasch: No more than 250 gallons of fuel per year or 1½ cords of wood per year as compared to 13½ cords per year without super-insulation.

Fuel Consumption Comparison

Superinsulated

250 gallons of oil per year

\$1.75 per gallon

\$437 per year

\$36.50 per month

\$1,750.00 - \$437.00 = \$1,313.00 = 75% savings!

Regular

1,000 gallons of oil per year

\$1.75 per gallon

\$1,750.00 per year

\$145.83 per month

Q: What is the cost of superinsulated materials?

Roggasch: In the village they would run \$60 per square foot. This cost would be the same for a superinsulated log home. We can go back to the traditional methods and build out of logs and insulate on the outside of logs to retain more of the thermal mass to keep the heat inside.

Q: Where is the insulation most effective?

Roggasch: First the floor, secondly the roof, thirdly the walls. When the floor is insulated you don't have the uneven distribution of heat (the heat rising to the ceiling because of a cold floor). A floor with a cavity beneath it is one way of having a warmer floor: build the floor with one layer of plyboard laid on 2x4's on their

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sides, then lay flooring on top of that, and cut holes at the ends of the flooring so air will flow through.

The roof should be insulated with at least 18 inches of fiberglass or cellulose. The insulation has to have air coming across in order to make it energy efficient. There is a thruss called an Arkansas Thruss. It is made to put 18 inches of insulation in it without closing it up and it has six inches of air space left over which addresses the ventilation problem. Walls, floor, and roof should have 18 inches of insulation. Windows should be beveled out to get maximum outlook and sunlight into the house.

Q: How do you measure how good insulation is?

Roggasch: By its R-value, which measures the resistance of heat transfer through an object. The higher the R-value the better for resisting heat or cold. An average 6-inch foil-backed fiberglass has an R-value of 19. Traditional houses have an R-value of 60. Superinsulated houses' R-values range between 54 and 100.

Q: Do you have any projects in the villages?

Roggasch: We have built one house in Galena and we are very willing to answer people's questions by mail or phone. Contact Roggasch and Associates, 529 Sixth Avenue, Fairbanks, Alaska 99701.