

The Thermal Efficiency of Chink Joints

In today's world, energy efficiency is a subject that most homeowners are aware of including log homeowners. This is also a potential concern for those contemplating the purchase of a log home. Therefore, we occasionally get asked about the R-value of our chinking and/or backing materials. Many people assume that they provide some insulation to the exterior walls. In fact, neither the Perma-Chink nor the backing material contributes any significant insulation to a wall. They do, however, eliminate outside air infiltration into the home. This has a much greater impact on the overall energy efficiency of a home than adding a minor amount of insulation to a wall.

The next question is what can be used in the void between the exterior and interior chink joints to increase thermal efficiency? Surprisingly, for many situations is nothing. Diagram 1 shows a cross section of a typical stud bay without any insulation in a stick-built home. During the winter the outside wall gets cold while the inside wall stays warm. The air next to the inside wall heats up and rises to the top of the bay. This sets up an air circulation flow where the heat from inside the home warms the outside wall thus increasing the energy usage in the home. During the summer, the circulation flow is reversed and the hot air next to the outside wall warms the inside wall. The objective of placing insulation between the studs is to eliminate this air circulation flow. But what is in insulation that reduces the conductivity of heat from one side to the other? Surprisingly the answer is air. Air is a very poor thermal conductor. The prime objective in most types of insulation is to entrap air in small cavities to eliminate any circulation. However, the matrix that holds these small air cavities does conduct heat. Since some insulation matrixes conduct heat better than others, it is this that differentiates the R-value of the various types of insulation like fiberglass, cellulose, styrene foam, etc. But it is the dead air spaces that do the work.

Diagram 1

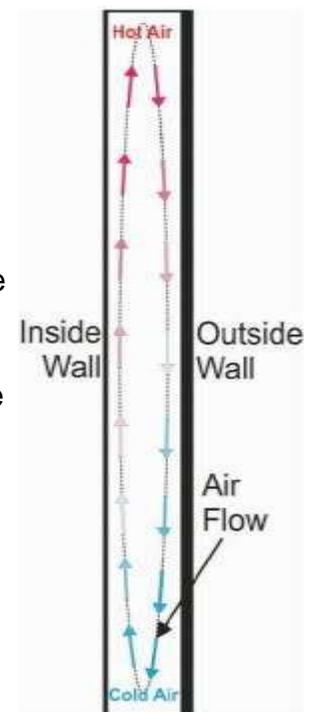


Diagram 2

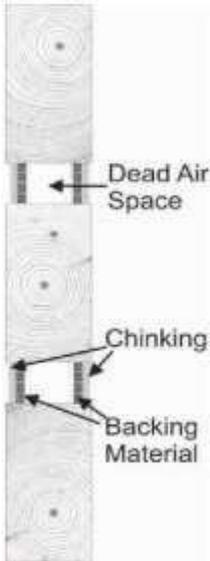


Diagram 2 shows the cross section of a chink joint. The space between the exterior and interior backing materials is dead air space. Attempting to gain thermal efficiency by filling the voids between the backing material in chink joints less than three inches wide is futile and may even be self-defeating. Perhaps, if you have a six-inch chink joint and live in Alaska it may be worthwhile to insulate this space. In this situation, there is a large enough temperature difference between the exterior and interior surfaces to start an air circulation flow pattern. However, for most log homeowners who live in a moderate climate zone and have a two to three inch chink joint, it is probably not worth the cost and effort.