



Air Krete: Foam Without Plastics

From Volume 6, No. 7 – July/August 1997

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Air krete insulation is not all that new-it has been around since the early 1980s. In that time, it has collected a small but very enthusiastic group of advocates, especially among the chemically sensitive. There are also skeptics, however, who are concerned about its long-term durability or just question whether it is worth the higher cost. Recent evidence about the product's firestopping capabilities may provide the big break air krete advocates have been waiting for.

Air krete insulation is essentially foamed minerals: magnesium oxychloride cement, derived from sea water, and a particular variety of ceramic talc mined in Governor, New York. These minerals are mixed with a proprietary foaming agent-"glorified soap suds," according to air krete inventor R. Keene Christopher-and sprayed with pressurized air through a foaming gun. The resulting foam has a density of 2.25 lb/ft³ (26 kg/m³). It takes a few hours to cure, so when it's being installed in open cavities a fine screen is stapled across the opening to hold the foam in place. Air krete used to be pink, but some purists objected to the use of red dye #2 food coloring, so it now has a blue-green tint, achieved with an inert mineral pigment.

Air krete is quite effective as an insulation, with an R-value of 3.9 per inch (RSI-27/m). Like other foamed or blown-in insulation, it is much more effective than batts at filling cavities, especially odd-shaped or hard-to-reach spaces. Air krete is not flexible after it cures, however, nor does it bond to surfaces, so shrinkage or movement in a frame may open up small gaps.

Air krete may be most notable for its performance as a firestop material. Although the company has long touted the fact that air krete will not create smoke or contribute to flame spread, its performance in a fire goes beyond these factors. Sea Cliff, New York architect Sergio Zori reports that a standard, 2x4-framed wall filled with air krete insulation has passed a 2-hour firestopping test. Anecdotal evidence seems to confirm this claim: One section of an old barn in Acworth, New Hampshire was converted to living space and insulated with air krete. A severe fire subsequently gutted the

living space, but the rest of the barn was saved. The building's owner and local fire officials credit air krete in the walls separating the barn from the residence for the building's survival. Air krete has also been used to retrofit party walls with inadequate fire-stopping characteristics in some New York City apartments and has been unofficially credited with preventing a fire from spreading there as well, according to Zori.

The two concerns most often raised about air krete are its friability and its apparent shrinkage. The cured material is undeniably friable, and it will turn into powder when rubbed, even lightly, by hand. This friability doesn't seem to be a problem in closed cavities, however, as we've seen samples several years old in perfect condition. In locations subject to extreme vibration, however, one may want to test the material before using it. The shrinkage issue is also unconfirmed, and independent tests conducted to meet state requirements in Minnesota measured no shrinkage at all. Gaps created by wood framing that has dried out are a likely cause of this perceived problem.

Although many chemically sensitive individuals swear by air krete, healthy housing expert John Bower is not among them. Bower advocates the use of conventional insulation materials, such as fiberglass or cellulose, while sealing the wall cavities effectively so occupants are not exposed to anything that might be released by the insulation. "I don't have a problem with air krete," he says, "I just think there are better places to spend your money."

As Bower notes, one of the objections to air krete is its relatively high cost. Prices vary by region and by the nature of the job, starting around \$.30 per board foot (\$127/m³), installed cost. Labor is an important factor, because of the work involved in stapling the screen over the cavities. For projects on Long Island, Zori has found air krete to be just slightly more expensive than Icynene. He uses many different types of insulation on various projects and finds air krete the most comfortable in terms of on-the-job irritants. He feels that with the added benefit of firestop-ping, it's worth the extra investment when possible, but he notes that for deep cavities in a roof or ceiling it becomes prohibitively expensive.

Zori finds air krete especially effective as a retrofit insulation for uninsulated walls. He also recommends using it around bathtubs and Jacuzzis: "We always try to spray around the tub when we have air krete on a job. It holds in the heat and dampens vibrations, creating a more solid feel for fiberglass tubs." Air krete literature also recommends the product for use in concrete blocks. While the material is likely to be compatible with the potentially damp conditions in the block, it may be hard to justify the cost in an application when most of the thermal resistance is short-circuited by the concrete.

Air krete was developed and is patented by Air Krete, Inc., of Weedsport, New York. The company licenses manufacturers and installers, providing them with the proprietary ingredients.

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