



## **White roofs go from 'uncool' to energy efficient**

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By: Tom Barry Contributing writer

Bryan Wormley has a pithy explanation for why business has been good at his Suwanee company. The company, which specializes in installing white roofs on commercial buildings, has been growing at a rate of 15 percent to 20 percent a year.

Cool.

"People want cooler buildings and lower operating costs," said Wormley, president of Wormley Brothers Enterprises. "A white roof can save on energy expenses in the summer, especially here in the South."

Democracy wasn't the only thing that emerged from Ancient Greece. Long ago, contractors there began using light-colored materials to keep buildings cooler, a practice that continued until the advent of modern air conditioning, when function gave way to appearance.

Despite their heat-absorbing ways, dark roofs came into prominence. Although cool thermally, white roofs, in a fashion sense, became decidedly uncool. Fact is, most folks like white roofs about as much as white socks with a business suit. And Atlanta's been no exception.

Back to the future. Today owners of commercial buildings are awakening to the fact that they can save an estimated 15 percent to 40 percent on air-conditioning costs in summer with a white roof, yet pay only slightly more in higher heating bills in winter.

"Cool roofs are the fastest-growing segment of the roofing industry," said Patrick Downey, president of Merik Inc., a roof consulting firm in Roswell.

White roofs also reduce the heat island effect in an urban area, a potentially critical boon for Atlanta, which famously suffers from a lot of bad-air days. Studies have shown that cities are often three to eight degrees warmer on hot days than outlying rural areas. The effect in Atlanta has been measured as high as 12 degrees. And heat is a major contributing factor to the formation of ozone.



"Computer models indicate that if every building had a reflective roof, there would be a significant lessening of the heat island effect," said Lucie Griggs, executive director of Rome-based Cool Communities Inc., a nonprofit environmental advocacy group.

It's no abstract, tree-hugger notion either. Beyond the health risks, high ozone levels lead to federal sanctions and loss of road money from Uncle Sam, said Melissa Witthun, a manufacturer's representative for Duro-Last Roofing Inc., a Michigan company that makes reflective roofing. Customers include Wormley Brothers.

"In summer, a black roof will heat up to 160 degrees Fahrenheit, while a white one will get only a few degrees hotter than the ambient temperature," said Witthun, who is based in Lawrenceville.

"Atlanta has a lot of black parking lot and road surfaces, and more and more trees are being lost in the region all the time," she said. "The quickest, most effective way to address our air problem is to re-cover black roofs with white when they need reroofing and to use cool roofs on new construction."

Although heat-reflective (or high albedo) roofing -- typically white with a smooth surface -- is a strong trend in the industry, experts believe that only about 2 percent of existing buildings in Atlanta employ it.

"The potential for change here is huge, not only in cutting air conditioning costs but in reducing air-quality problems," Downey said. "Changing the color of the roof has more impact on costs than anything else a building owner can do. The roof comprises a larger portion of a building's envelope than the walls."

Downey estimated that 10 percent to 15 percent of replacement roofing and new roofing today is made of reflective material. "People are turning to it mainly because of the energy savings," he said.

Georgia State University uses cool roofing wherever possible, said GSU facilities engineer Marty Waterfill.

"We do everything we can to lighten the color," she said. "Sometimes we use white and other times a gravel surface. The main reason is that it adds to the longevity of the roof. Plus, it helps reduce the greenhouse effect in the city."

Still, there are reasons -- beyond fashion and inertia -- why darker roofs have won the commercial race thus far. White roofs used to be more expensive and thinner



(single-ply), making them more susceptible to punctures and leaks. Black roofs also don't show dirt and scuff marks as readily as, and may require less maintenance than, their white counterparts.

"A roof can have air conditioning equipment that needs servicing on a regular basis, and so the foot traffic can be pretty severe," Downey said.

But he adds that cool roofing today "is no more expensive than any other roofing system" and that multiple layers of material can be used to increase strength.

Notably, Georgia has been a leader in the cool-roofing movement. Several years ago, it became the first state to amend its building code to recognize the benefits of reflective material. The "White Roofing Amendment" became part of the Georgia State Minimum Code for Construction.

"Heat puts a tremendous load on a roof," said retired Georgia Tech architecture professor Max Akridge, one of those who worked for passage of the amendment. "In experiments, I've seen roof temperatures reach 180 degrees."

Under the amendment, building owners installing a cool roof -- a purely voluntary move -- are not required to put in the same level of insulation as otherwise. Eventually, the federal standard built on the Peach State amendment.

"Georgia was the first state to codify the benefits of heat-reflective roofing," Downey said. "We led the nation."