



# Add Energy Savings to Your Roof System

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**An overview:  
Minor roofing modifications can enable economic paybacks.**

It is now clear that substantial energy savings can be had with attention to choosing the proper roof surface — and this can be achieved with simple methods that also address your other roofing needs.

The primary purpose associated with Pace's systems is roof construction savings through maintenance and preservation. Significantly, there is also a documented, substantial energy savings benefit when a highly reflective solar white surface is introduced. In a study funded by the U.S. Department of Energy at Lawrence Berkeley Laboratory, **test results show air conditioning energy use can be reduced by up to 50% compared to a previously uncoated metallic roof surface**<sup>1</sup>.

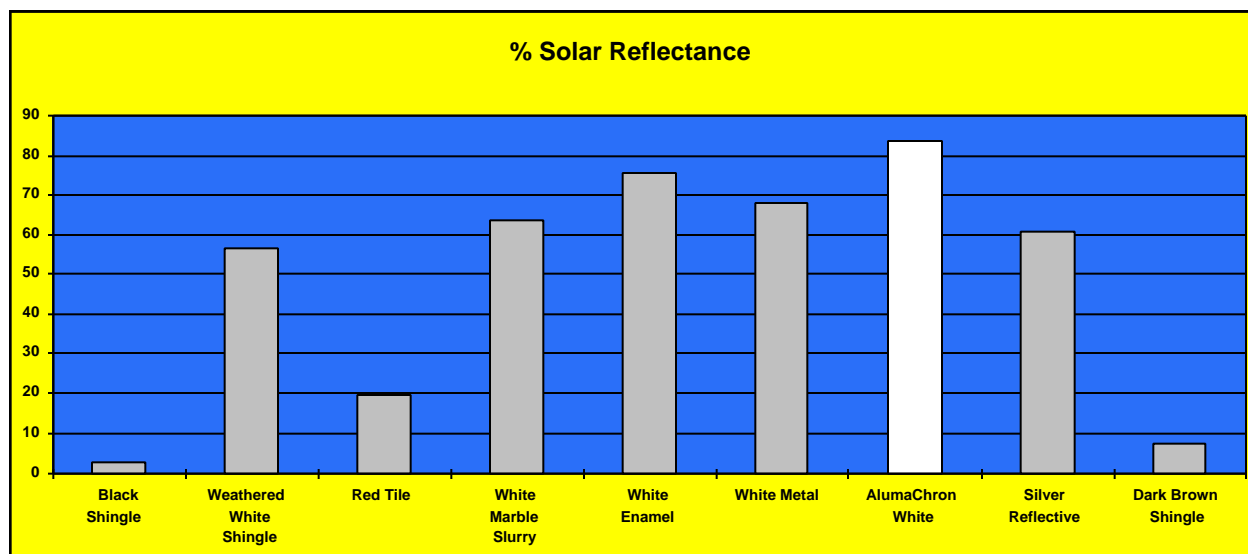
These cooling energy consumption reductions are impressive. When choosing the best or correct white material for the roof surface, other factors such as window openings, interior heat generation, and type of use, will modify the resulting energy savings. In the same tests for example, air conditioning energy consumption was reduced to approximately 40%, when a white roof is compared to a dark colored roof.

## Savings Also Occur on Insulated Roofs

The importance of this factor is also evident on an insulated roof. In a study performed in Mississippi<sup>2</sup>, two identical side-by-side commercial office buildings were monitored for summertime air conditioning consumption. R-11 insulation was a roofing component installed in both buildings. The roof of one of the buildings was coated with reflective white. **Outcome: Air conditioning was further reduced by 21.9% during summer months in the building with the reflective white roof.**

These substantial savings favor highly energy efficient finishes. A similar experiment performed for Florida Power & Light company on seven retail shops in a strip mall showed a 25% reduction in measured space cooling after the metal roof was treated. Consequently, the more air conditioning energy consumed, the greater the long-term cost recovery will be with a highly solar reflective material like ALUMACHRON™. This can be a significant factor, because the longer the roof remains in service, the greater the payback in energy savings.

**“ ... By far the most important property (of the material composition of reflective roofing materials) is their solar spectral reflectance ... ”**



## The Choice is Compelling

Research is increasingly revealing significant cost recoveries as a result of selecting the appropriate rooftop protection. Additional results from testing performed in Florida by the Florida Solar Energy Center<sup>3</sup>, the Atlas Weathering Services Group DSET Laboratories<sup>4</sup>, and others, confirm the findings. **In one of the most crucial factors of all, solar reflectivity, ALUMACHRON™ produces among the highest of energy returns.**

When selecting a system, strongly weight the above to maximize your annual energy savings. The cumulative savings can be greater than one might expect. While no one can guarantee a specific energy savings, picking the product with the greatest performance can assure greatest long-term savings. Weatherproofing, seam and fastener protection and reinforcement of your roof system are most critical. **Added substantial recoveries can be repeated year after year when a highly rated solar reflective material like ALUMACHRON™ is chosen.**

From D.S. Parker of the Florida Solar Energy Center:

... By far the most important property (of the material composition of reflective roofing materials) is their solar spectral reflectance as evaluated by ASTM Test E-903 ( the best materials will have integrated solar reflectance of 80% or better). Of secondary importance is their long-wave infrared emissivity (evaluated by ASTM E-408) with larger values (>90%) being desirable. Another important property, yet one which cannot yet be quantified, is their resistance to soiling and microbial growth. Generally, the

former will be enhanced by a smooth surface (e.g. ceramic particles will increase dirt/dust retention) although roof slope is a major factor.

Ceramic beads, and their reported insulating qualities are unimportant, in my view, in terms of cooling performance. Solar reflectance, is, however, all important. And the very whitest materials will have this aspect. . . <sup>5</sup>

As shown by these tests, a choice of ALUMACHRON™ will provide superior solar reflectance and maximize energy savings attainable by solar reflective membrane systems.

## REFERENCES

- <sup>1</sup> Bretz, S. and Akbari, H., 1993. Durability of High Albedo Coatings, LBL-34974, Lawrence Berkeley Laboratory, Berkeley, CA.
- <sup>2</sup> Boutwell C.J. and Salinas, Y., 1986. "Building for the Future-Phase I: An Energy Saving Materials Research Project," Mississippi Power Company, Rohm and Haas Company and the University of Southern Mississippi.
- <sup>3</sup> Parker, Danny S. and Barkaszi, Stephen F., Jr., 1994. Roof Solar Reflectance and Cooling Energy Use: Research Results from Florida, FSEC-PF-274-94, Florida Solar Energy Center, Cape Canaveral, Florida..
- <sup>4</sup> Eoff, Kathleen R. and McGreer, Matt, 1997. Total Emittance and Hemispherical Spectral Reflectance Test Report, Report No.: 4908000, Atlas Weathering Services Group DSET Laboratories, Florida Solar Energy Center, Cocoa, Florida
- <sup>5</sup> Note from D.S. Parker to Pace Products Int'l, Inc. 12/31/96.