

Future of air conditioning is white paint

[Environment](#), [Air](#)



Every year, sometime between Lent and Corpus Christi, my grandmother used to soak water in the kitchen stove and stir it slowly, while pouring metallic porcelain cups filled with salt. Then, he added the hydrated lime and mixed everything until it acquired a texture similar to that of the watery paint. It was then when we ran the house. Us, and all the people. Because as Romans, Andalusians and old Christians had done before, that of dressing the streets in white and decorating them with geraniums and gypsies was not one of the few ways we had to flee from the heat as the soul that the devil carried. Then came the air conditioning and changed everything. So many centuries fleeing the heat. He gave us life and, at the same time, he filled us with problems. Because air conditioners and other similar methods not only consume huge amounts of energy, but often require the use of products harmful to the ozone layer and global warming.

I have commented more than once: the paradox of air conditioning is that they cool the interiors, helping to warm the rest of the world. Fortunately, it is not the only alternative. This is what experts call 'passive daytime radiative cooling' (PDRC), a phenomenon by which a surface can cool down by reflecting sunlight and radiating heat into the atmosphere. That is, a type of surfaces usually produces a net heat loss, even under sunlight. It treats of surfaces with a high solar reflectance and a high thermal emission.

Something that brings the logic of the traditional whitewashing of my people to a level capable of competing with air conditioners. It sounds good, but one thing is to say it and another is to do it.

A new polymer. Effectively, developing this type of surface has been a challenge. Most of the proposals that have been made so far were

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expensive, complex, inapplicable or all that at the same time. But a research group at Columbia University that can turn this around. They have developed a high performance exterior PDRC coating that acts as a spontaneous cooler. It is a porous polymer that scatters and reflects sunlight due to differences in the refractive index between the air voids and the surrounding polymer. Before we said that it is necessary to achieve a high reflectance and a high thermal emission and they have achieved 96% in the first and 97% in the second. Some great data. So much that researchers are already in talks with the industry.

Above all, because it is applied as paint on ceilings, buildings or, in general, anything that can be painted. Tests have shown that the polymer achieves 6 degrees in the hot and arid desert of Arizona and 3 degrees in the humid and tropical environment of Bangladesh. Will we see it soon in the market? It is not clear: the roads of the industry are almost inscrutable. But everything to indicate that it is this polymer or another is a technology that is about to arrive. “ Now is a critical time to develop these types of solutions,” say the authors. And they are right.