

BRUSH AWAY HIGH ENERGY BILLS

The wonder of ceramic insulating paints.

Michael Trunko

Facility managers and building owners continually search for ways to reduce their energy bills. Most of these decision-makers also have maintenance crews regularly painting walls, ceilings, air conditioning ducts and other surfaces inside or outside their facilities.

Imagine if every time a surface was painted, it was also insulated, without any additional work. A new coating technology is available that provides insulating properties to paints for use on interior and exterior surfaces. The coatings can reduce energy consumption and provide substantial savings on utility bills.

Any retail facility or commercial building can become much more energy efficient simply by applying ceramic insulating paint or insulating additives for paint. These types of products insulate any painted surface by reflecting radiant heat, restricting thermal heat conduction, and reducing sound transfer through the painted surface.

"Ceramic insulating paints are based on the same insulating ceramic technology used in high heat kilns, steel production, cookware, and further developed by NASA for use in space vehicles to reduce heat," says Al Abruzzese, director of operations for Hy-Tech Thermal Solutions, LLC, of

Melbourne, Florida. "These paints reduce heat transfer by reflecting heat away from the painted surface and by forming a UV blocking barrier. They dramatically reduce heating and cooling loss."

Hy-Tech researches, develops and produces specialized paints, coatings and composites for insulating properties, rust and corrosion control, fire protection and sound deadening.

CERAMIC INSULATING PAINTS

Abruzzese attributes the effectiveness and success of special paints to high-performance insulating ceramic microspheres, a technology originally developed by NASA thermal research to deal with the high heat problems of space flight vehicles. Shaped like hollow balls and about the size of a grain of flour, the microspheres are non-combustible and fairly chemical-resistant, with a very high crush strength.

The ceramic microspheres, in effect, produce miniature thermos bottles that resist thermal conductivity, suppress sound and reflect heat away from the protected surface. When combined with other materials, these microspheres enhance the thermal resistance of those materials.

The paint additive resembles talcum powder, and mixes easily into

any type of paint or coating. The circular shape of the microspheres causes them to perform like ball bearings rolling upon each other and allowing the coatings to flow smoothly. When applied as paint to a surface, the microsphere coating shrinks down tight and creates a dense film. The resulting ceramic layer improves fire resistance, protects from ultraviolet rays, repels insects such as termites, and shields from the destructive forces of nature.

Conventional paint pigments are sharp-edged and pack down loose as the paint film dries, leaving paths for heat to pass through. The jagged edges also make for a rough surface, which grabs dirt and soils easily.

Dried ceramic paint provides tremendously improved scrub-ability. Its tough ceramic shell also increases the longevity of the paint that it is mixed into and makes the surface more durable. Ceramic paints far outlast conventional paints.

"A typical can of paint basically consists of water, resin binders and various pigments," says Abruzzese. "[You can] increase the resin content and replace inexpensive pigments with a high concentration of premium white titanium dioxide and insulating ceramics. A higher concentration of insulating ceramics is possible

since the 'filler' pigments are eliminated."

Insulating ceramics are available as stand-alone products that can be mixed into store-bought paints, or as pre-mixed coatings for interiors, exteriors, waterproofing and roofs. The additives do not change the application or adhesion of the paint.

WHERE TO APPLY THE COATING

No single insulating paint or additive is appropriate for every type of surface. The coating or additive chosen must target a specific heat transfer reduction solution for the application, whether residential, commercial or industrial.

Abruzzese says you can purchase a ceramic additive and mix it into any type of paint or coating and add the insulating properties of the ceramics to that paint. The easy-to-use, non-toxic, white-powdered insulating additive adds heat reflecting properties to wall and ceiling paints, roof coatings, industrial paint and other coatings. Factory mixed coatings, with the insulating ceramics already mixed in, are also available.

Many facilities start with insulating paints by applying a barrier coating as a primer to the interior walls facing the exterior of their building and to the ceilings that butt up to the attic or roof.

"After applying the primer, you can apply a finish decorative color coat of special premix insulating paint for additional insulation, or you can use any locally available paint and stir in an insulating additive," Abruzzese says. "This reduces the amount of heat that penetrates down through the ceiling from the attic, and through the walls that face the exterior."

Applying an insulating coating to exterior walls restricts heat loss through the walls in the winter and heat gain during the summer. For cement and stucco surfaces, it is best to use an elastomeric coating. This thick, rubber-like coating forms a continuous, flexible, insulating membrane on the exterior walls. Due to their high content of specialized

resins, elastomeric coatings last three to four times longer than conventional paints.

"In all honesty, if your summers are short and summer heat is not a big problem, your roof products should be your last consideration," Abruzzese says. "The payback period for roof coatings is quite long due to your short summer cooling requirements, and that is where these products perform best."

Extensive studies, evaluations and test results confirm that ceramic filled coatings control heat through reflection at the source, substantially reducing the absorption of heat by the substrate. Reflecting heat back to the source and rapidly dissipating it is the answer to keeping heat out in the summer and keeping heat in during the winter, rather than only slowing down the conduction of the heat with traditional insulation.

COST-EFFECTIVENESS

"Adding an insulating ceramic additive to your own paint costs only 3-4 cents per square foot," states Abruzzese. "For very little cost, you will lower your utility bills, extend the life of your heating and cooling equipment, and make your facility more comfortable while increasing the durability of your paint."

More than half of the energy used in the average building is for heating and cooling. Therefore, utilizing insulating paint products can result in substantial savings in energy costs.

"Your actual savings depends on several factors, such as the number of areas you paint, number of coats, colors used (darker colors absorb more heat), type of construction, and so on," says Abruzzese. "Not everyone is prepared to completely repaint their entire building, so start with the applications that are affordable and offer the highest energy saving returns. You can begin with your interior ceilings and walls."

When companies compare the difference in price between the paint they previously used versus a ceramic insulating paint, Abruzzese says they

always agree that it doesn't pay not to use it. But, should a company purchase ready-mix coatings or additives?

"If you're set up with a local paint firm using custom colors and you're getting a great price, then you may want to stick with them and just use additives," says Abruzzese. "But when you consider the convenience of pre-mixed paints, reduced labor due to no mixing and a higher concentration of insulating ceramics, then pre-mix coatings [might be] the best return."

Maintenance crews at more and more facilities are using insulating coatings every time they paint inside or out, and the end result is that eventually all their buildings and surfaces will be repainted with energy-saving insulating coatings.

"If you have to paint anyhow, why not use an insulating paint?" asks Abruzzese. "Each time you apply the coatings, you'll realize enormous benefits and savings. When your entire building is painted, your savings will go on forever." **PRSM**

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